6.6.4 Analysis of the K-factor

After modifications to the analysis of the storm intensification factor M and the convergence component of the 100-year level of precipitation were finalized, the orographic intensification factor K was calculated using equation 6-5. The K-factor analysis for California is shown in Figure 6.6. In some instances, PMP calculated from equation 6.4 was considered too high or too low within an area, and slight modifications were made to the non-orographic fields to rectify the anomalies. In this situation percent changes were incorporated into the existing K-factor field in order that PMP values be adjusted to an acceptable level. In other circumstances where the calculated K-factors (usually at centers of maximum or minimum values) were at a level believed to be reasonable, but where the particular maximum or minimum was slightly offset with respect to a topographic feature to which it was related, changes were made to the K-factor field to achieve proper alignment. The PMP Index map was calculated using a K-factor field which includes percentage changes in limited areas and alignment corrections.

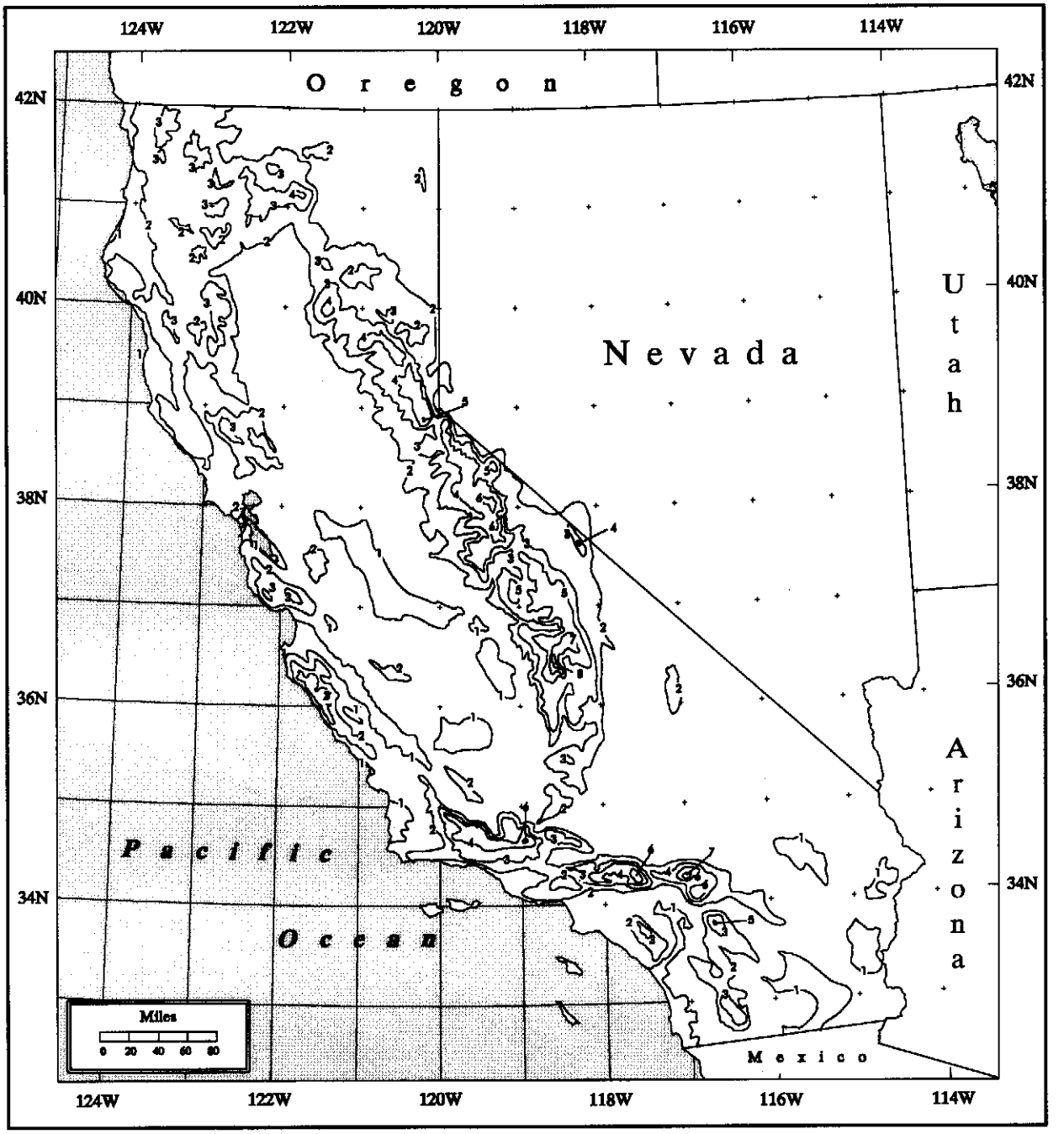

Figure 6.6. *The orographic influence (K-factors) for California.*

7. GENERAL-STORM PMP INDEX MAP AND SEASONAL VARIATION

7.1 Introduction

A general-storm Index map of California probable maximum precipitation (PMP) was developed for 24 hours and 10 mi^2. Calculations were done using a combination of a Geographical Information System (GIS) application (GRASS 4.0, 1991) and software developed exclusively for the task. The result was a 15 by 15 second grid of raster values which completely cover the study area. Adjustments were made to both the grid point values and the contours of PMP by making percentage changes to selected sets of grid points, redrawing contours and re-analyzing them. The finished analyses are printed as Plates 1 and 2 for southern and northern California, respectively.

The standard contour intervals in the Plates are as follows: every half-inch up to 11 inches, every inch between 12 and 15 inches, and every 3 inches above 15 inches. The larger contour interval above the 15 inch depth was required to preserve visible separation between adjacent contours at the map scale of 1:1,000,000. A consequence of using the provided PMP Index maps is that the interpolated values may differ from user to user. One advantage of constructing a digital PMP index field is that identical results can be found by different users. The digital ascii version of the map is available at the Hydrometeorological Design Studies Center web site. Of course, GIS software must be in place to use these data.

An example of the contour field from the PMP Index map, as originally calculated from equation 6.4 and adjusted where deemed necessary is shown in Figure 7.1. The adjustments for all of California are discussed in the next section. The main features of the PMP Index map are quite similar to the isopluvial features of the 100-year, 24-hour precipitation map for California in NOAA Atlas 2 (1973), even though the level of PMP varies from about twice to over 4.5 times the 100-year level. A ratio map of PMP to the 100-year 24-hour values is shown in Chapter 11, Figure 11.1.

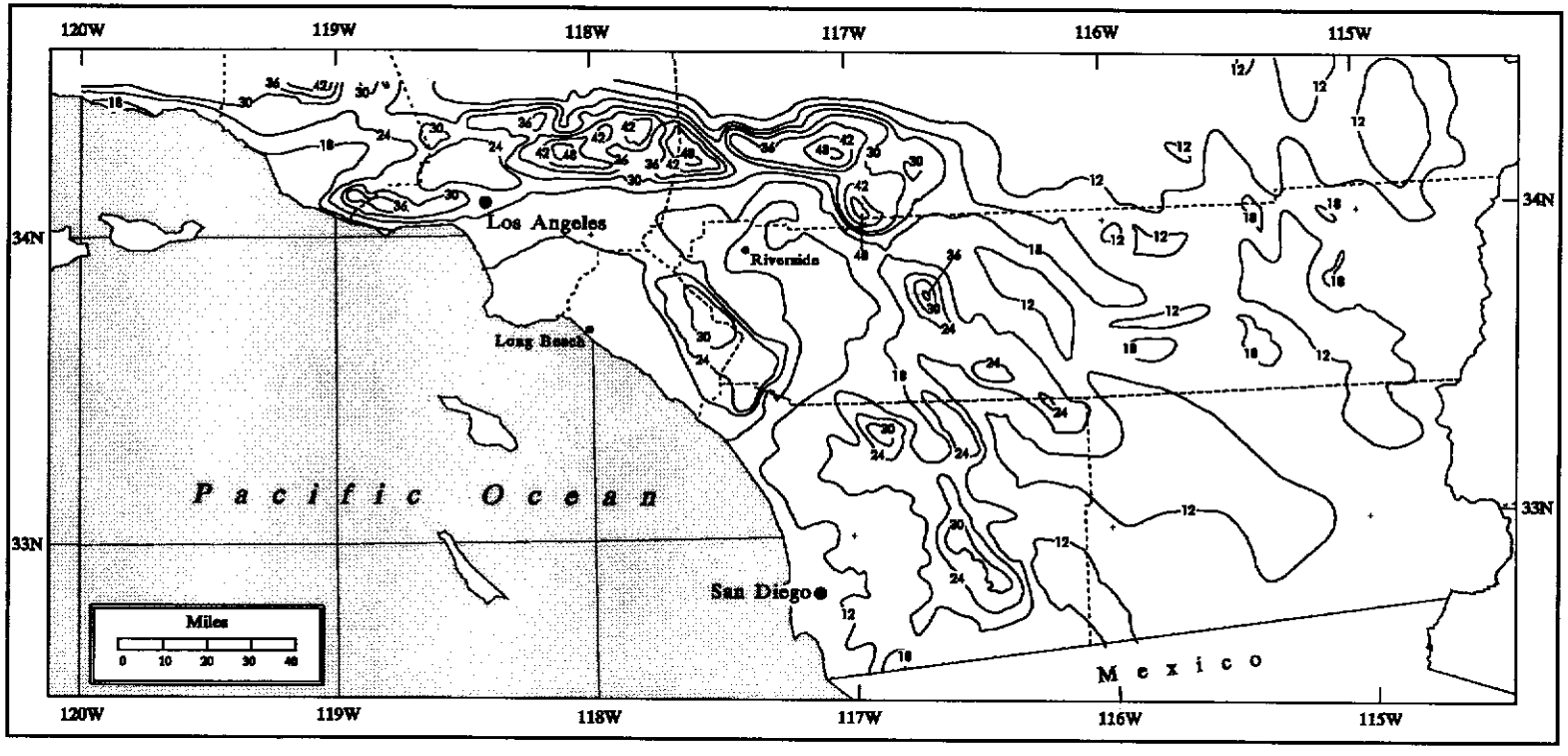

Figure 7.1. *HMR 59 PMP estimates for a portion of southern California at 10 mi^2, 24 hours. Contours are at 6 inch intervals.*

7.2 Adjustments to the General Storm Index Map

Several comparisons were made between the index values of PMP and the following: the 100-year and longer return-period precipitation; PMP index values from HMR 36 (1961); and the greatest recorded 1-day and 24-hour amounts for California. These comparisons indicated a need for adjustments to the calculated index PMP depths at some locations and across some regions. Examples of these adjustments follow.

As a result of the comparison with NOAA Atlas 2, north of the 35th meridian the largest values in the Sierra Nevada mountains were increased by up to 25 percent, while similar maxima along the coastal ridges were decreased up to 12 percent, so that the relations of the PMP values to one another would more closely resemble the relations in NOAA Atlas 2 for the 100-year level of precipitation. Within the area of percentage increases in the Sierra, an area in the vicinity of Sirretta Peak, northeast of Bakersfield, showed a total increase of about 40 percent due to an undervaluation of orographic enhancement in the original calculations. The under-enhancement arose from what was perceived to be an underestimate of the 100-year level of precipitation in that location. In the Coastal mountains to the northwest and northeast of Santa Barbara, the gradient of PMP was relaxed on the slopes of these mountains so that it would more closely resemble the gradient of the 100-year return period precipitation shown in NOAA Atlas 2.

In comparisons with draft PMP values, an observed daily storm amount reached 94 percent of PMP in the northern Central Valley. A decision was made to increase the Index map by up to 10 percent in this region to decrease the ratio of the observed value to PMP and bring it more into line with other values in the area.

Decreases up to 22 percent in the draft PMP estimates were made in the area around Stockton and San Jose, based on comparisons with HMR 36 and by concluding that the 1000-mb, non-orographic PMP pattern in that area reflected the values from the Central Valley more closely. In the mountains east of Riverside the draft value of PMP calculated as a maximum near the crest of the San Gorgonio Mountain, was reduced by around 25 percent. Furthermore, the maximum was relocated further downslope on the windward side to conform more closely with patterns established for PMP in the Sierra. Maximum levels of PMP were increased up to 12 percent near the crests of isolated mountain peaks in the

desert region of southeastern California to bring their levels into closer conformity with the (adjusted) levels at the southern end of the Sierra Nevada. Finally, very small adjustments were made near the 42nd meridian so that there would be very close agreement with the PMP index level in HMR 57 (1994).

The calculation of PMP involves the interaction of four independent variables: the 100-year level of precipitation from NOAA Atlas 2 (T), the non-orographic component of the 100-year level of precipitation (C), non-orographic PMP (FAFP), and the storm intensity factor (M). A given percentage change in any one of the first three independent variables will produce an equal percentage change in the dependent variable (PMP). A given percentage change in the M factor will produce a smaller percentage change in PMP for the range of M factors in California (which range from 0.0 to 0.55). Because of the sparseness of extreme-storm data, and since the data that are available tend to be concentrated in densely populated areas, a degree of analytical discretion was used in performing the analysis of C, FAFP, and M. Changes of 5 to 10 percent in the value of C, FAFP and M can account for a 20 to 25 percent change in PMP. When comparisons with the 100-year precipitation frequency, HMR 36 PMP values, or the greatest one-day and 24-hour amounts dictated changes in PMP of 20 to 25 percent, we reviewed the original analyses of C, FAFP, and M to determine whether changes of 5 to 10 percent could be justified. If so, the changes were accepted.

This practice should not be taken to imply that the finalized index PMP values of this report can be lowered or raised by 25 percent anywhere a user chooses, but only that changes of this order were justified during preparation of the final product where the low density of extreme-storm data makes such choices reasonable. In the very few instances when adjustments in excess of 25 percent were deemed necessary, it was assumed that the orographic factor K alone was responsible for any unrepresentativeness in the calculation of PMP.

7.3 Monthly Variation of PMP Index Values

Monthly PMP values were constructed based upon the all-season 10-mi^2, 24-hour PMP index values. Monthly PMP index amounts are shown as a percentage of all-season general storm PMP in Figures 7.2 to 7.11. The monthly index values are to be used with the

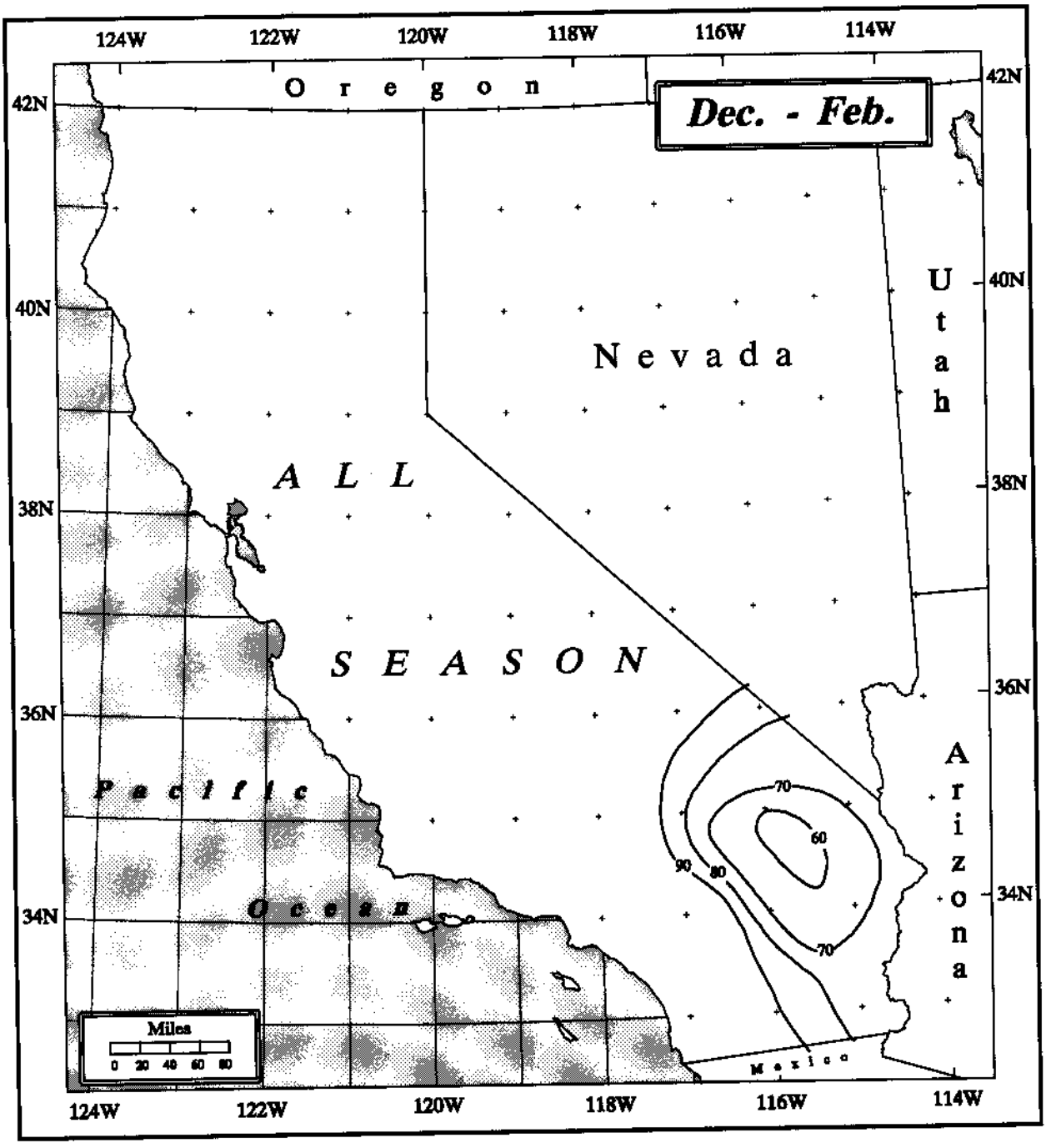

Figure 7.2. *10-mi² 24-hour general-storm PMP for December through February in California as a percent of all-season PMP (Plates 1 and 2). Same as Figure 13.1.*

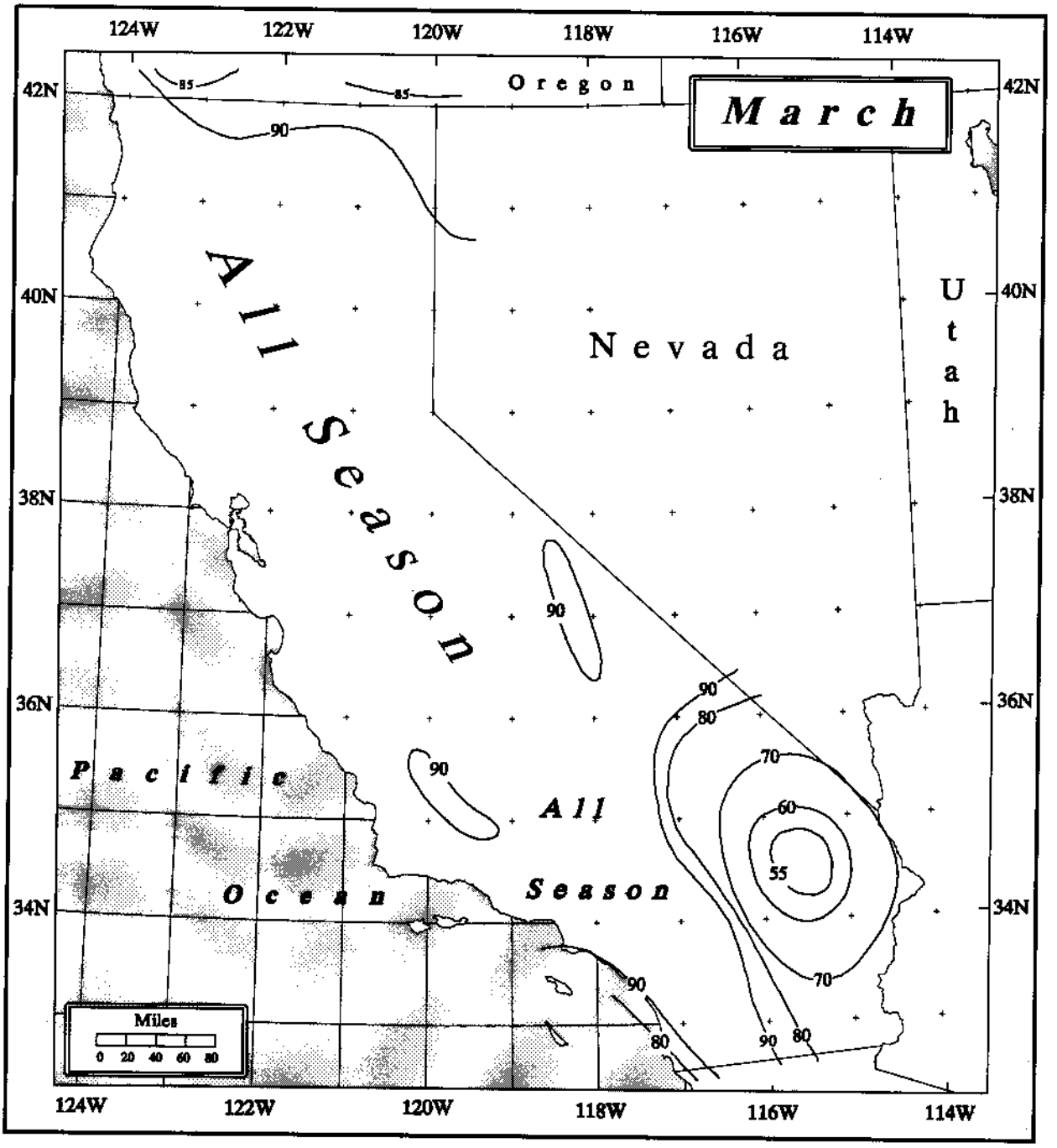

Figure 7.3. *10-mi² 24-hour general-storm PMP for March in California as a percent of all-season PMP (Plates 1 and 2). Same as Figure 13.2.*

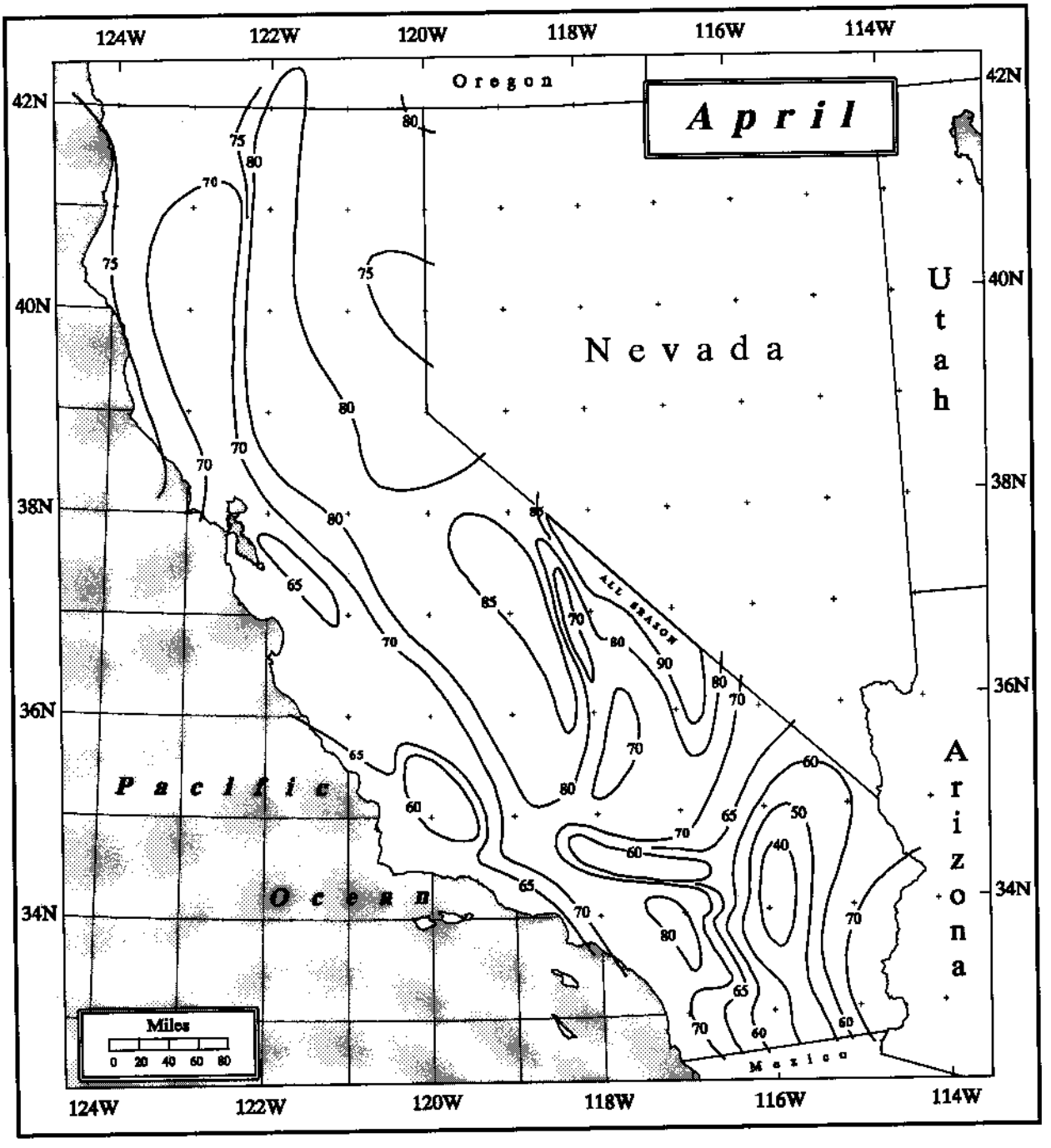

Figure 7.4. *10-mi² 24-hour general-storm PMP for April in California as a percent of all-season PMP (Plates 1 and 2). Same as Figure 13.3.*

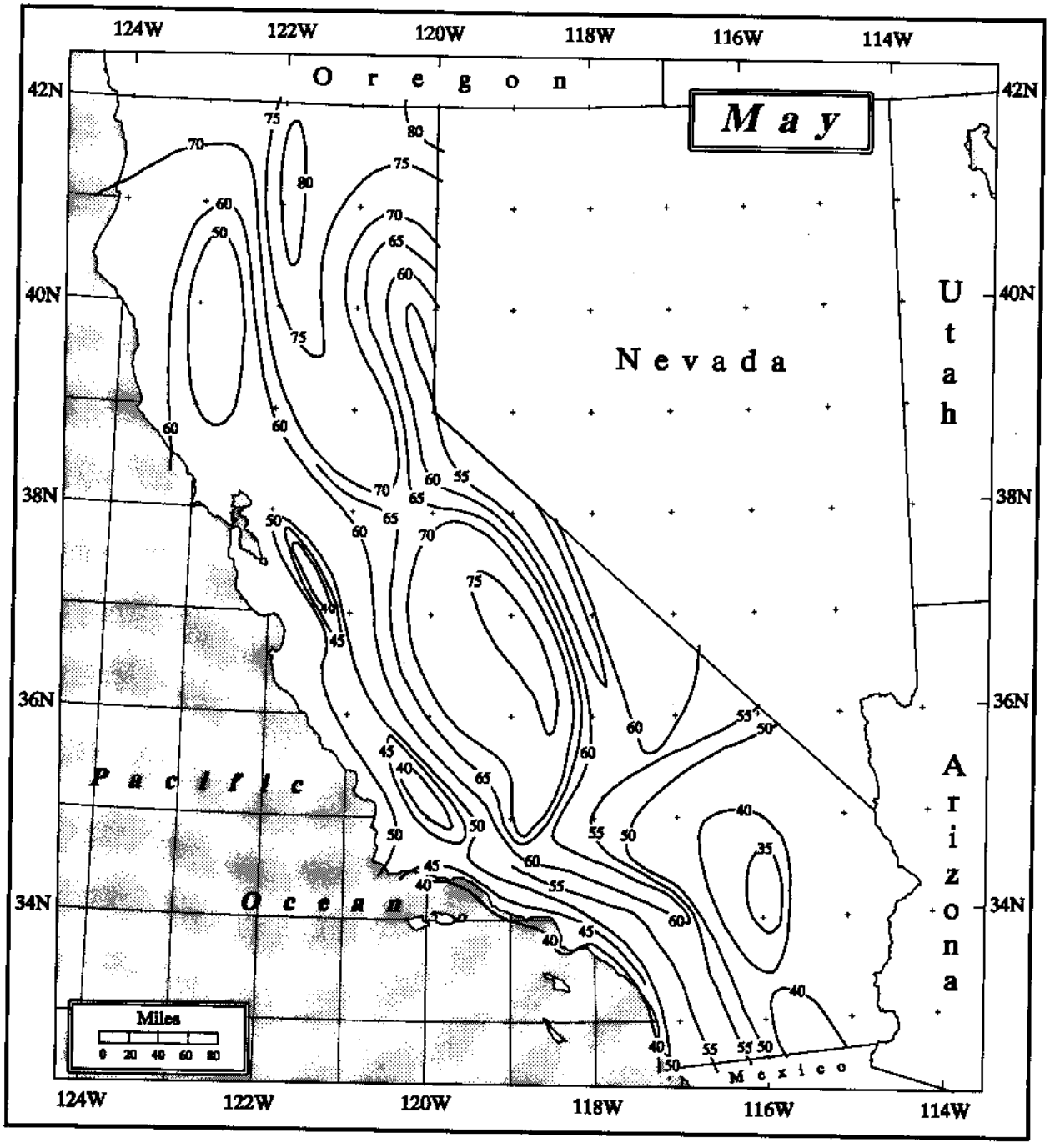

Figure 7.5. *10-mi² 24-hour general-storm PMP for May in California as a percent of all-season PMP (Plates 1 and 2). Same as Figure 13.4.*

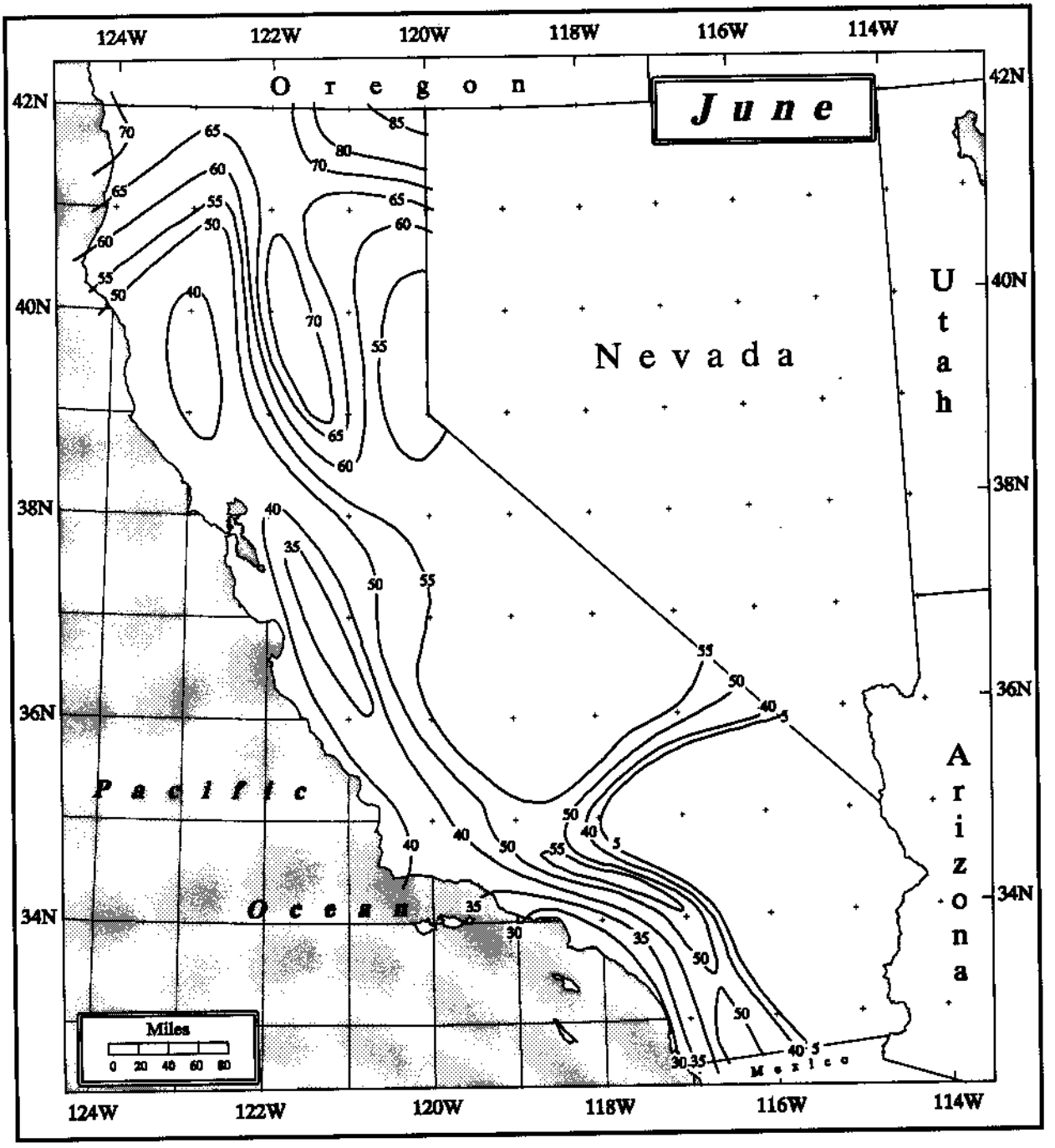

Figure 7.6. *10-mi² 24-hour general-storm PMP for June in California as a percent of all-season PMP (Plates 1 and 2). Same as Figure 13.5.*

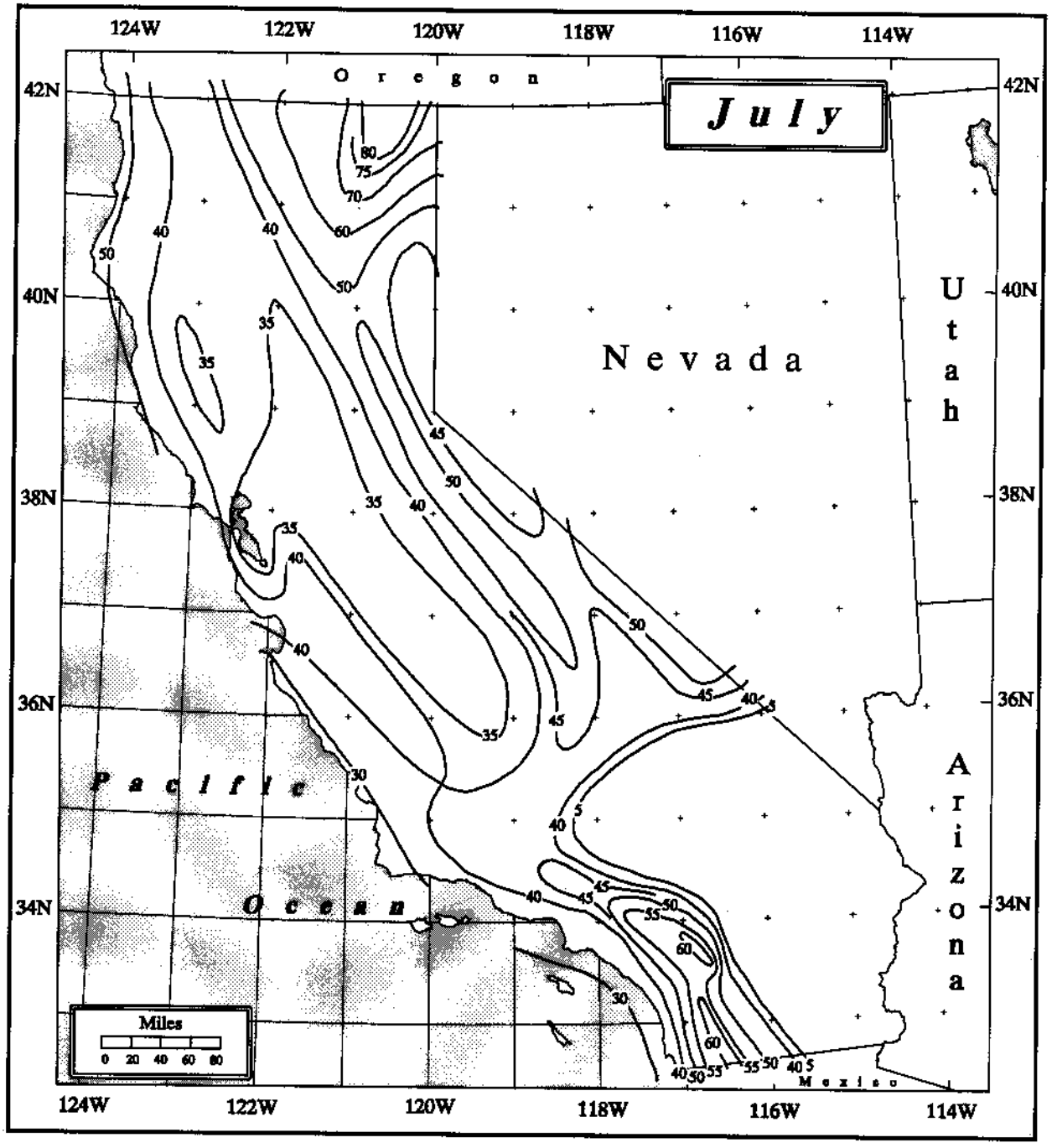

Figure 7.7. *10-mi² 24-hour general-storm PMP for July in California as a percent of all-season PMP (Plates 1 and 2). Same as Figure 13.6.*

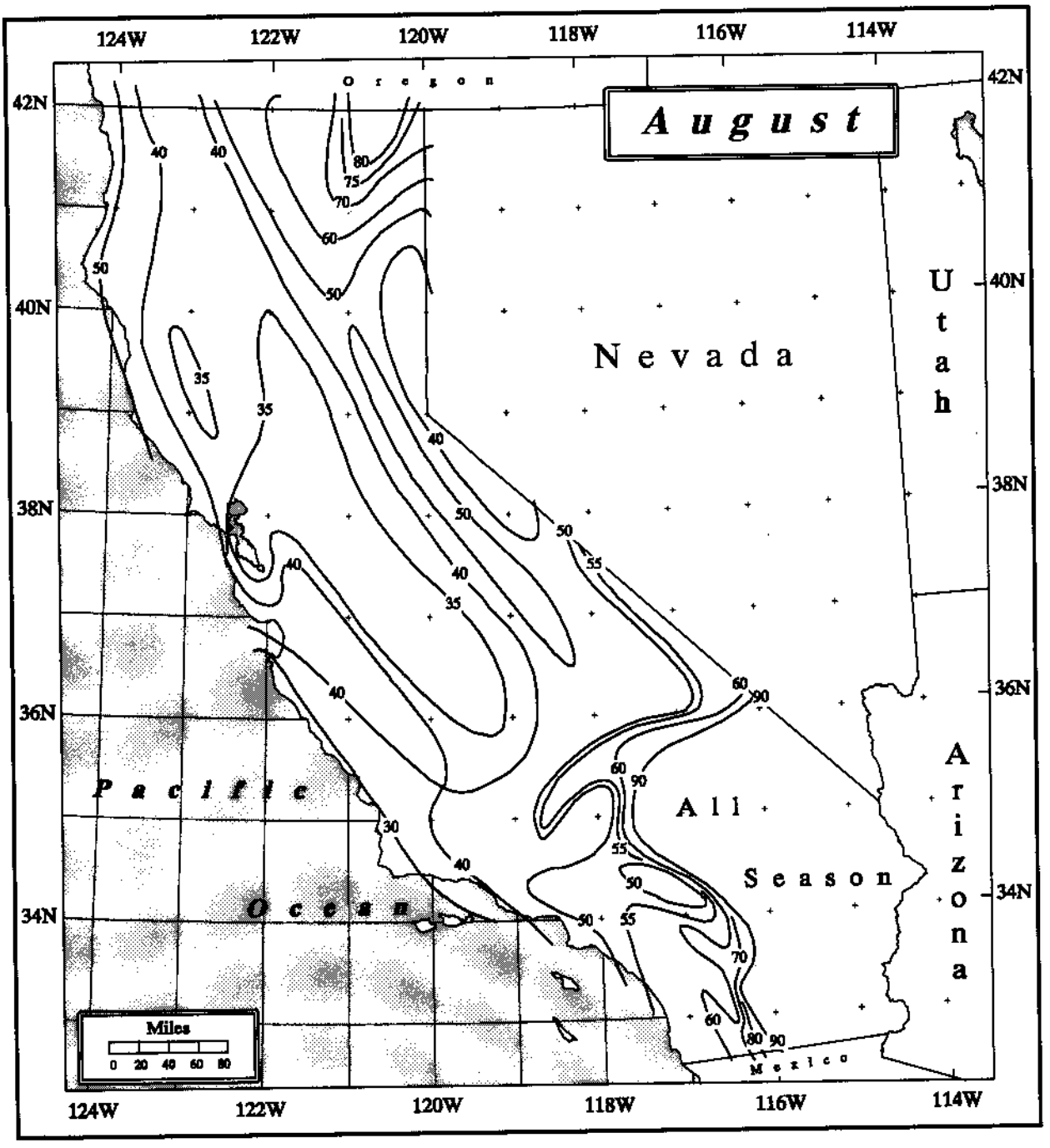

Figure 7.8. *10-mi² 24-hour general-storm PMP for August in California as a percent of all-season PMP (Plates 1 and 2). Same as Figure 13.7.*

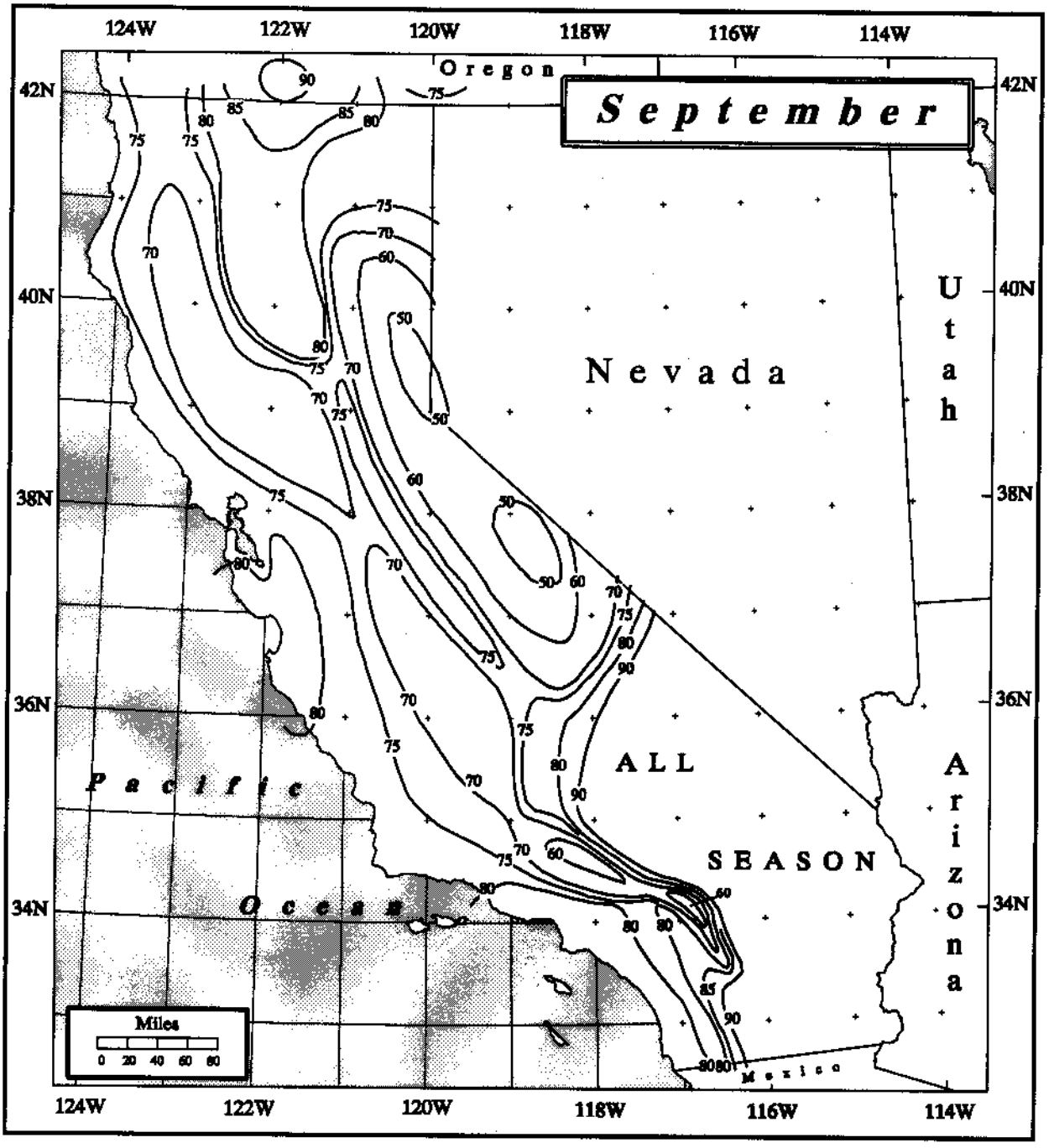

Figure 7.9. *10-mi² 24-hour general-storm PMP for September in California as a percent of all-season PMP (Plates 1 and 2). Same as Figure 13.8.*

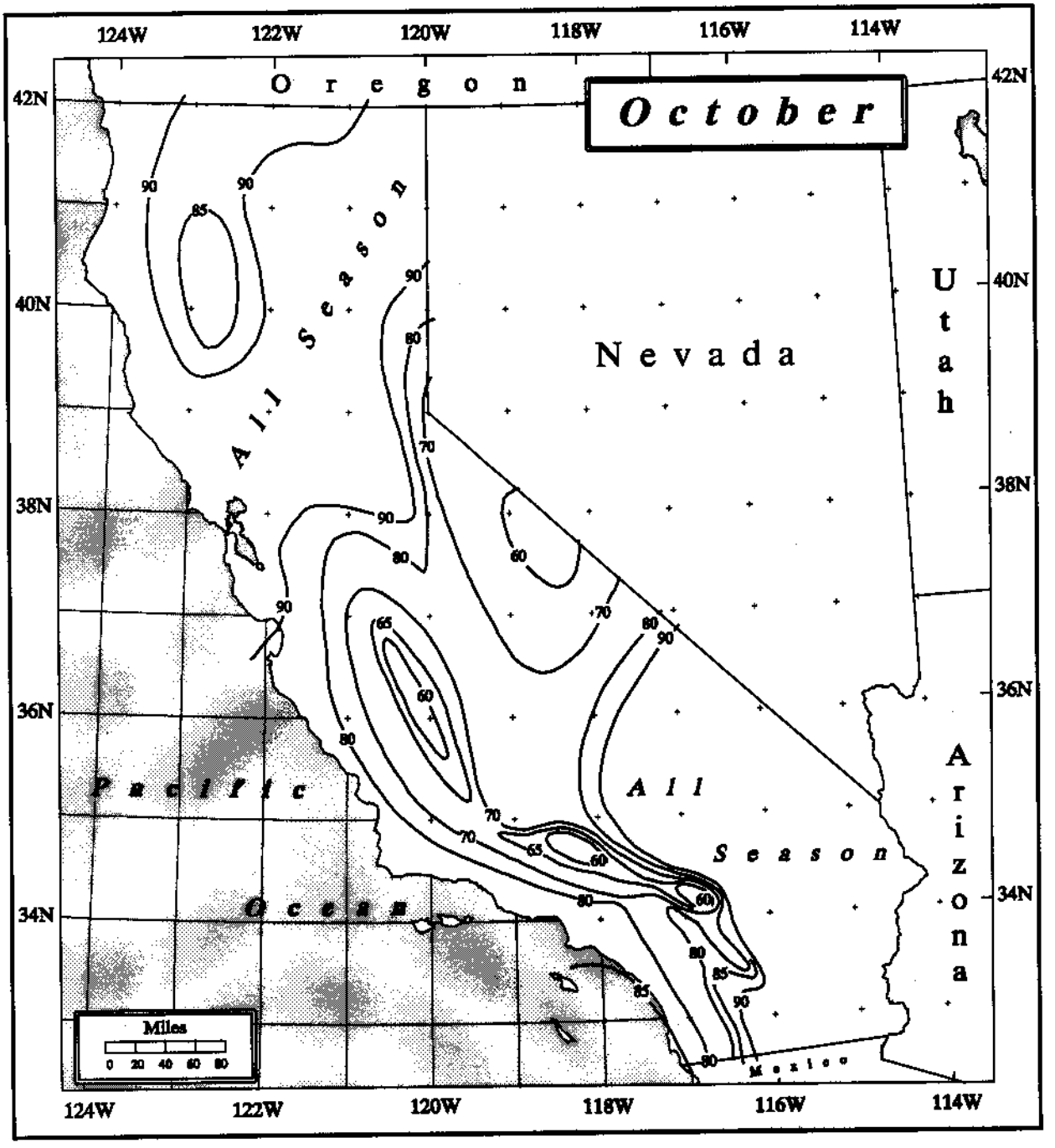

Figure 7.10. *10-mi² 24-hour general-storm PMP for October in California as a percent of all-season PMP (Plates 1 and 2). Same as Figure 13.9.*

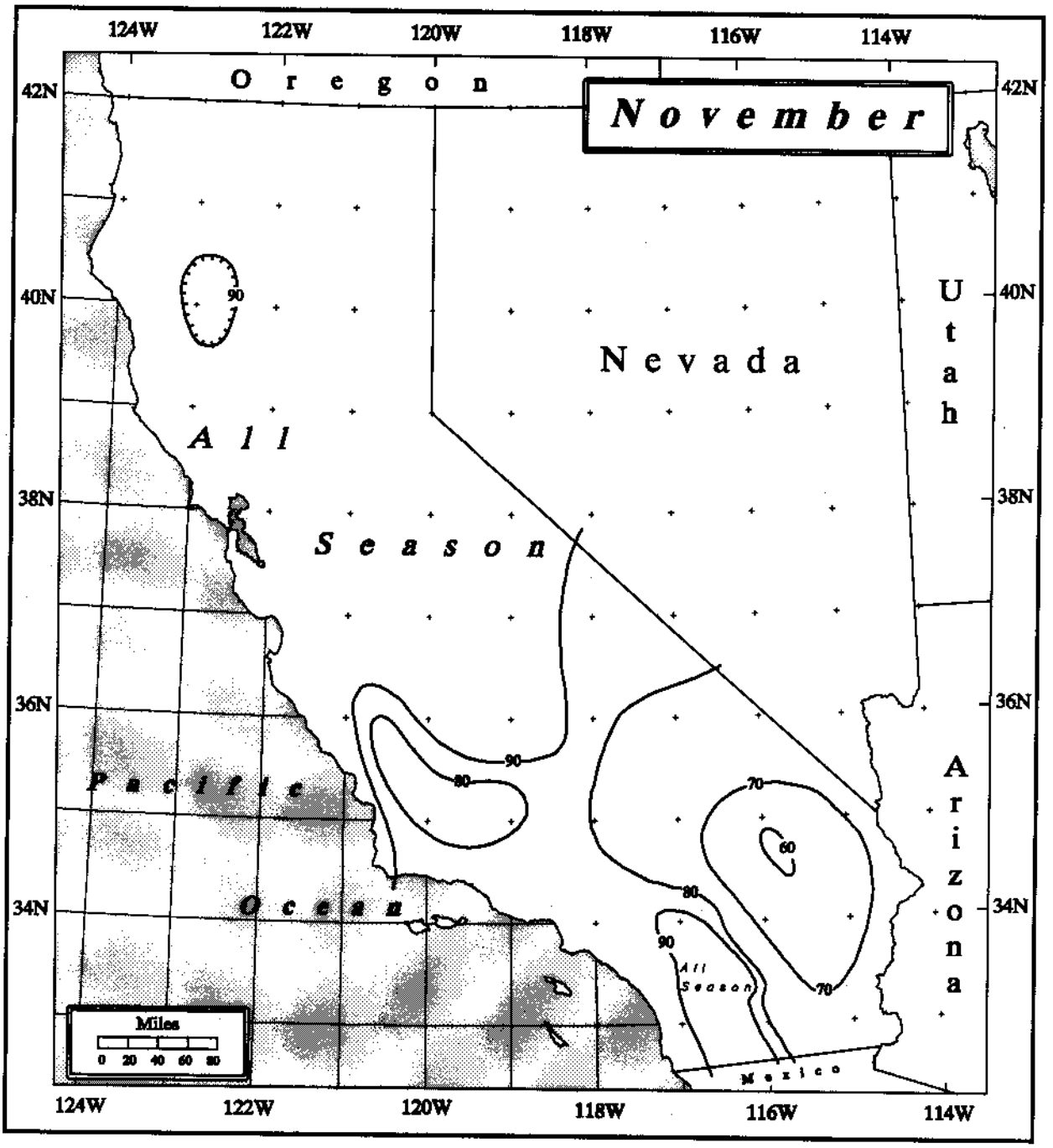

Figure 7.11. *10-mi² 24-hour general-storm PMP for November in California as a percent of all-season PMP (Plates 1 and 2). Same as Figure 13.10.*

seasonally-adjusted depth-area-duration (DAD) relations which are discussed in Chapter 8.

The key notion involved with the seasonality maps is that monthly variation of index PMP is well-represented by the monthly variation of maximum recorded daily precipitation. Over 400 locations across California had precipitation records of sufficient length to be useful. Forty-eight percent of these locations had records of at least 40 years, while close to 10 percent (or 38 locations) had records of at least 50 years. Sixty-four percent of these locations were below 2,000 feet elevation, 29 percent were at 2,000 to 5,000 feet, and only 5 locations were above 7,000 feet.

The daily maximum precipitation amounts for each month were normalized by dividing each month's amount by the largest annual maximum at each site. For instance, if the maximum 24-hour precipitation recorded at a site in August was 5 inches and the all-time maximum 24-hour precipitation at the same site was 10 inches the resulting ratio would be .5 or 50 percent. The resulting ratios, coded at 1,000-foot intervals above 2,000 feet, were then plotted on the maps for analysis. No month showed any apparent elevation-ratio dependency within the regions used to establish DAD uniformity. The regional boundaries for DAD are shown in Chapter 3, Figure 3.3. A degree of dependency was discernable, however, between the ratio and latitude. The southeastern region showed the strongest physiographic influence on the distribution of ratio values on seasonality. This region contains the Mojave Desert and its attendant northward extending valleys, and the desert surrounding the Salton Sea eastward to Arizona. The ratios at the crests of the mountains essentially define the northern and western edge of the southeastern DAD region. In Figures 7.6 and 7.7 a strong gradient of percentage (from 5 to 40 percent) can be seen across the western and northern edge of the Southeast region and is well-supported by observations. An average value of 22.5 percent is recommended for use with basins located between these two isopercental contours. The southeastern region experiences its largest PMP storm in late summer, whereas the rest of California experiences their PMP storms in winter. Of some interest is the observation that the months of maximum and minimum general-storm PMP potential are juxtaposed in the southeastern region, whereas they are separated by 5-6 months for the rest of the state. The temporal transition in the Southeast region changing from 5 to 90 percent is exceptionally abrupt in the month of July. When constructing a smooth curve of annual variation of percentage (see discussion below), the curve will be very sharply pitched for the transition from July to August for locations in the Southeast

region. We recommend such curves indicate a value of 85 percent for the dates July 31 and August 1.

The analysis of the monthly percentages in Figures 7.2 to 7.11 was guided by the following principles:

1. Within each DAD regions and for a given month, it is assumed that the location of the largest observed percentage is a matter of chance, given that the period of record is relatively long and that the maximum percentage could, therefore, have occurred anywhere in the region.

2. If adjacent DAD regions for a given month have significantly different maximum percentages found within their boundaries, then a gradient of percentage is assumed to exist along the periphery of the regions for that month.

3. In deciding the level of percentage to assign across all or part of a region, greater influence was given to those observations associated with: longer period of record, associated largest depth, and fewer nearby observations.

4. In the Southeast region, large general-storm precipitation was not observed for the greater portion of June and July. During these months, 10-mi^2, 6-hour PMP is produced by the local storm. The percentage of all-season general storm PMP may reach zero percent, but was set at 5 percent since the period of recorded observations in this region is on the order of a quite short 100 years.

5. When spot checks of the annual cycle of percentages revealed a brief monthly departure from a trend not observed elsewhere in the vicinity, the monthly isopercental analyses were revised at that location to eliminate the irregularity.

6. Although local storms produced some of the large percentage values found in the Southeast region during the months of maximum convective potential, there were enough instances of large percentages associated with general storms to justify the all-season categorization for this region in August and September.

Figures 7.2 to 7.11 contain no isopercental contours labeled greater than 90. Places where the percentages exceeded 90 have been identified as *all-season* for the given month(s) because it was assumed that at such times and places, the full 100-percent index amount of general-storm PMP should be expected. To assure that any irregularities in the annual cycle of percentages which remain are removed, we recommend that when setting the annual cycle for any location, all 12 monthly percentages be plotted at the mid-point of each month and smoothed if necessary. To achieve this, adjustment of plus or minus 5 percent may be employed, except when an all-season value (> 90 percent) is indicated.

Finally, when deciding on an off-season, drainage-average index value of general-storm PMP for a specific drainage across which there is a gradient of percentages for any month, it is recommended that an average percentage within the drainage be selected to represent the whole drainage for that month. Percentages so obtained would be used to represent the annual cycle of percentages for the specific drainage. These average values could be smoothed under the constraints mentioned above.

8. GENERAL-STORM DEPTH-AREA-DURATION

8.1 Introduction

Depth-area-duration (DAD) data from storm events are the basis for development of depth-duration and depth-area relations. Those depth-duration and depth-area relations are then used with the 10-mi^2, 24-hour probable maximum precipitation (PMP) Index map (Plates 1 and 2) to develop storm-centered average depths of PMP for a selected duration and area size. Development of the PMP Index map is discussed in Chapter 7. Both the depth-duration and depth-area relations were a product of the combination and comparison of storm events occurring in or transposed to a particular region. The depth-duration and depth-area relations were normalized to 10 mi^2. They are based on highly smoothed within-storm depth-area-duration data from important storms, as well as on continuity with relations developed for adjacent areas. The term within-storm is a storm characteristic determined when values of various parameters are required to be from the same storm.

The depth-duration and depth-area relations vary within the state and were assigned to regions. The regional boundaries were determined from major topographic features and precipitation climatology (regional DAD boundaries are shown in Chapter 3, Figure 3.3).

8.2 Adopted Relations

Table 8.1 defines the depth-duration relations for general-storm, all-season PMP at 10 mi^2 in California. To obtain depth-duration ratios for durations other than those in the table, the user should draw a smooth curve connecting the listed values on semi-log graph paper (a ratio value of 0 at a duration of 0 hours) extracting the ratio at the desired duration. The value for depth-duration is just one factor that will eventually be multiplied by the PMP index value (see Chapter 13).

Regional depth-area reduction percentages for the all-season PMP storm are listed in Table 8.2 for selected area sizes durations and regions. The data from Table 8.2 are presented graphically in Figures 8.1 to 8.6. Examples of data from several record-setting

storms and the relationship between the adopted DAD for two of these regions are shown in Figures 8.7 to 8.10. These examples show that the smoothly varying sets of DAD relationships describing a PMP storm are not found throughout all area sizes and durations in some of the outstanding storms within a region. However, some of the storms characteristics are quite close to those anticipated in a PMP storm. Figures 8.7 to 8.10 are based on the data in Tables 8.3 and 8.4. In a few instances, the percentages in Table 8.4 for a fixed area size will decrease as duration increases, eg. the storm 575 at 500 mi^2 and between 6 and 24 hours. The respective depths corresponding to these percentages (68, 61), however, are 4.67 and 11.95 inches (see Appendix 1) so no violation of depth-area rules has occurred. Seasonally adjusted depth-duration relations for California general storms are discussed in Section 8.3. All DAD relations presented in this chapter are expressed as percentages of an index value of general-storm PMP averaged across an area, typically that of a particular drainage.

Table 8.1. *All-season PMP depth-duration ratios for 10 mi^2 for California regions.*

	Duration (hours)					
Region	**1**	**6**	**12**	**24**	**48**	**72**
Northwest	0.10	0.40	0.73	1.00	1.49	1.77
Northeast	0.16	0.52	0.69	1.00	1.40	1.55
Midcoastal	0.13	0.45	0.74	1.00	1.45	1.70
C. Valley	0.13	0.42	0.65	1.00	1.48	1.75
Sierra	0.14	0.42	0.65	1.00	1.56	1.76
Southwest	0.14	0.48	0.76	1.00	1.41	1.59
Southeast	0.30	0.60	0.86	1.00	1.17	1.28

Table 8.2. *All-season depth-area relations for California by region (percent of 10 mi²).*

Northwest / Northeast

Area (mi²)	1 hr	6 hr	12 hr	24 hr	48 hr	72 hr
10	100.00	100.00	100.00	100.00	100.00	100.00
50	87.50	88.50	90.00	91.50	93.00	94.00
100	82.00	84.00	86.00	88.00	89.50	91.00
200	77.00	79.50	82.00	84.00	86.00	87.75
500	69.50	73.00	76.25	78.25	81.00	83.00
1000	63.00	67.50	71.00	73.50	76.50	79.00
2000	55.50	60.50	64.00	67.00	69.50	72.00
5000	42.50	49.50	52.50	56.00	59.00	62.00
10000	32.00	40.00	43.50	47.00	51.00	54.00

Midcoastal

Area (mi²)	1 hr	6 hr	12 hr	24 hr	48 hr	72 hr
10	100.00	100.00	100.00	100.00	100.00	100.00
50	87.50	88.75	90.00	91.00	92.00	93.00
100	81.75	83.75	85.50	87.00	88.50	90.00
200	75.75	78.25	80.50	82.50	84.50	86.25
500	67.50	71.00	73.50	76.00	78.50	80.50
1000	60.75	65.50	68.00	70.50	73.00	75.50
2000	53.00	58.50	61.50	64.00	67.00	70.00
5000	38.00	44.50	48.50	52.00	55.00	59.00

Central Valley

Area (mi²)	1 hr	6 hr	12 hr	24 hr	48 hr	72 hr
10	100.00	100.00	100.00	100.00	100.00	100.00
50	84.50	87.25	89.50	91.50	92.75	94.00
100	77.25	81.00	84.00	86.50	88.50	90.50
200	70.00	74.50	78.00	81.00	83.00	85.00
500	59.75	64.75	68.75	72.00	74.50	77.00
1000	51.00	56.50	61.00	64.50	67.00	69.50
2000	41.00	47.50	52.00	55.50	58.50	61.50
5000	27.00	33.75	38.50	42.00	45.25	48.50
10000	14.00	21.00	26.00	30.00	33.00	36.50
10000	25.00	34.00	38.00	42.00	45.00	49.00

Table 8.2 (cont.) *All-season depth-area relations for California by region (percent of 10 mi^2).*

Sierra						
Area (mi^2)	**1 hr**	**6 hr**	**12 hr**	**24 hr**	**48 hr**	**72 hr**
10	100.00	100.00	100.00	100.00	100.00	100.00
50	88.00	89.00	90.00	91.00	92.50	94.00
100	82.50	84.00	85.50	87.00	89.25	91.25
200	76.75	78.75	80.75	82.75	85.50	88.25
500	69.25	71.75	74.25	77.00	80.50	83.50
1000	63.25	66.25	69.25	72.25	76.25	79.75
2000	57.00	60.00	63.50	67.00	71.25	75.25
5000	47.50	51.00	55.00	59.00	63.50	68.00
10000	40.00	44.00	48.00	52.50	57.50	62.00
Southwest						
Area (mi^2)	**1 hr**	**6 hr**	**12 hr**	**24 hr**	**48 hr**	**72 hr**
10	100.00	100.00	100.00	100.00	100.00	100.00
50	87.75	88.50	89.50	90.50	91.75	92.75
100	81.75	83.25	84.75	86.25	87.75	89.25
200	75.75	78.00	79.75	81.50	83.75	85.75
500	67.50	70.50	72.50	75.00	77.50	80.00
1000	60.00	63.50	66.00	69.00	71.75	74.75
2000	51.00	56.00	59.00	62.00	65.00	68.00
5000	35.00	41.00	46.00	50.00	52.50	56.00
10000	22.00	30.00	34.00	38.00	42.00	46.00
Southeast						
Area (mi^2)	**1 hr**	**6 hr**	**12 hr**	**24 hr**	**48 hr**	**72 hr**
10	100.00	100.00	100.00	100.00	100.00	100.00
50	89.00	90.50	91.75	93.00	94.50	96.00
100	83.50	85.25	87.25	89.00	90.75	92.50
200	76.50	79.75	82.00	84.00	86.00	88.00
500	66.00	70.75	74.00	76.50	78.75	81.00
1000	56.50	63.25	67.00	70.00	72.50	75.00
2000	46.00	54.75	59.00	62.00	64.75	67.50
5000	31.25	41.50	47.00	50.00	52.50	55.50
10000	19.00	30.00	36.00	39.50	42.50	45.00

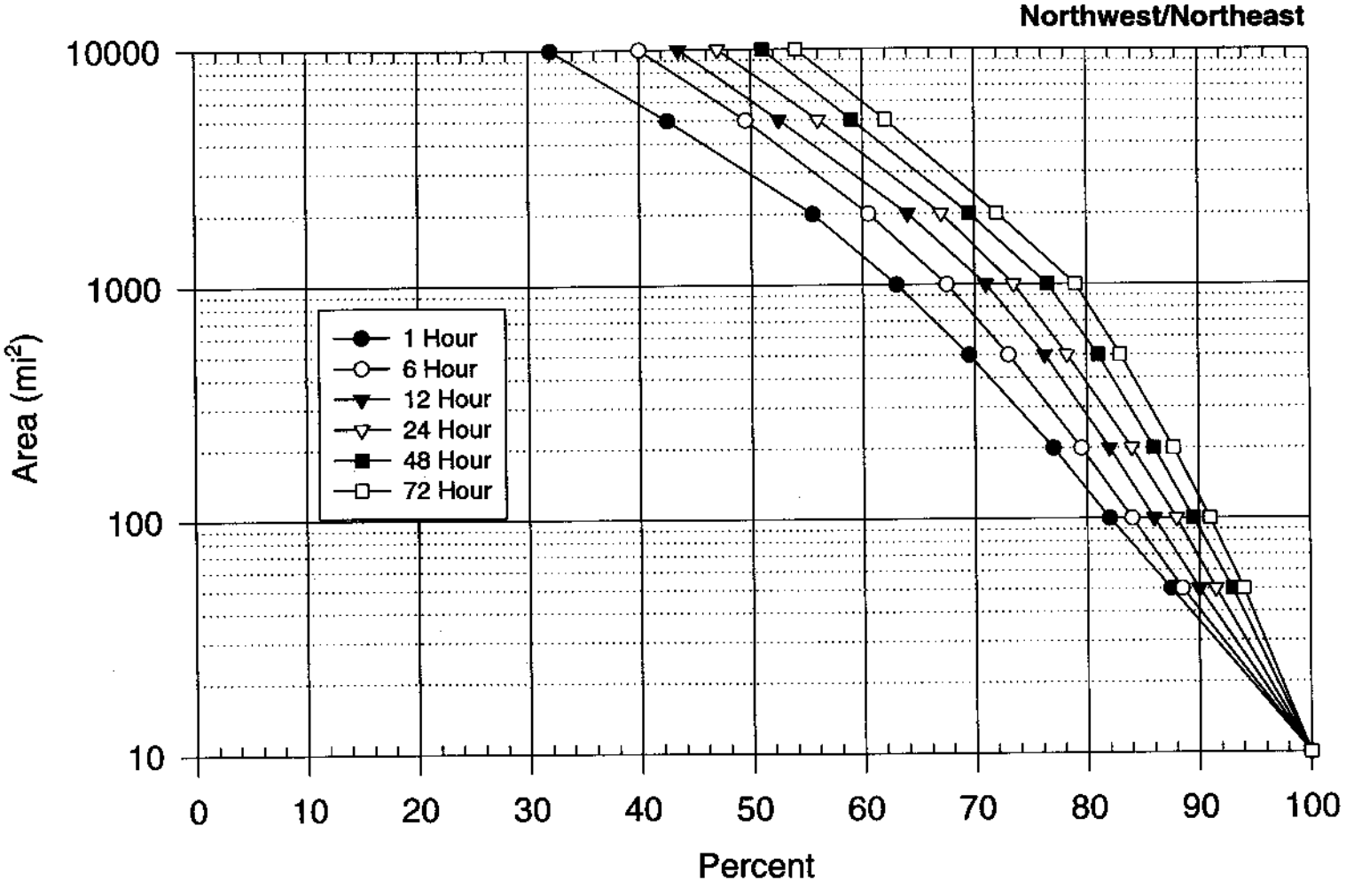

Figure 8.1. *Depth-area relations for the California Northwest/Northeast region for 1 to 72 hour durations. Same as Figure 13.12.*

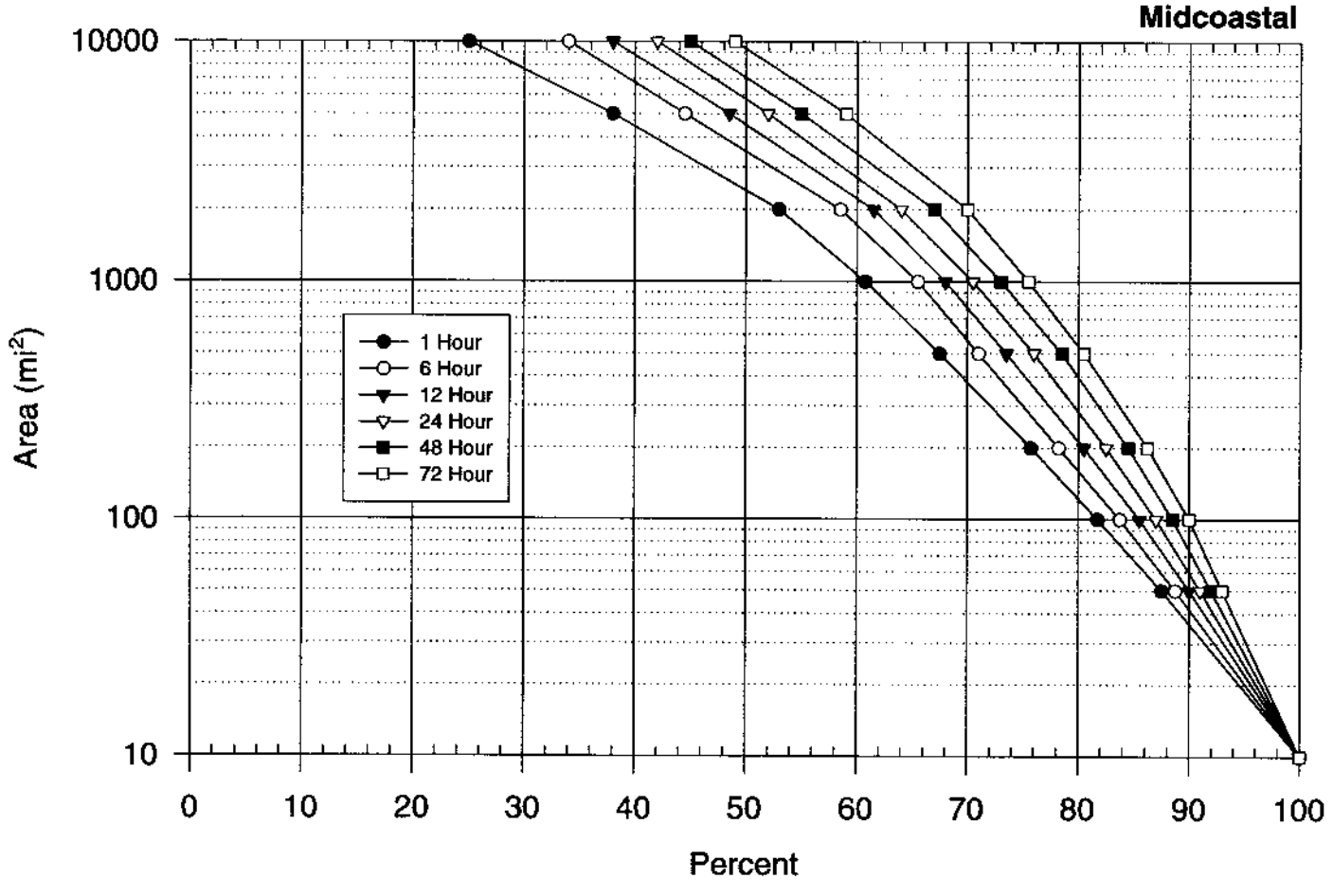

Figure 8.2. *Depth-area relations for the California Midcoastal region for 1 to 72 hour durations. Same as Figure 13.13.*

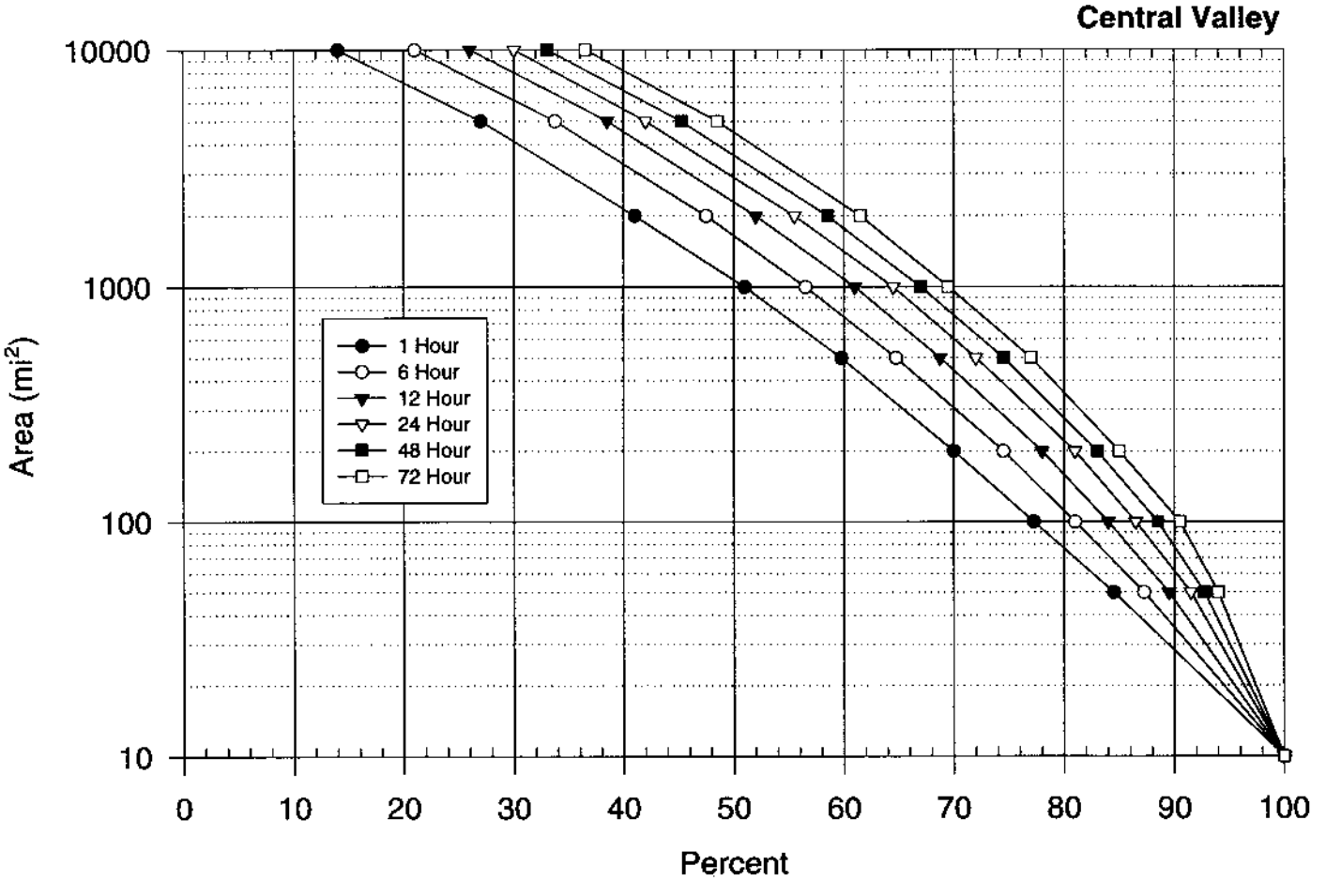

Figure 8.3. *Depth-area relations for the California Central Valley region for 1 to 72 hour durations. Same as Figure 13.14.*

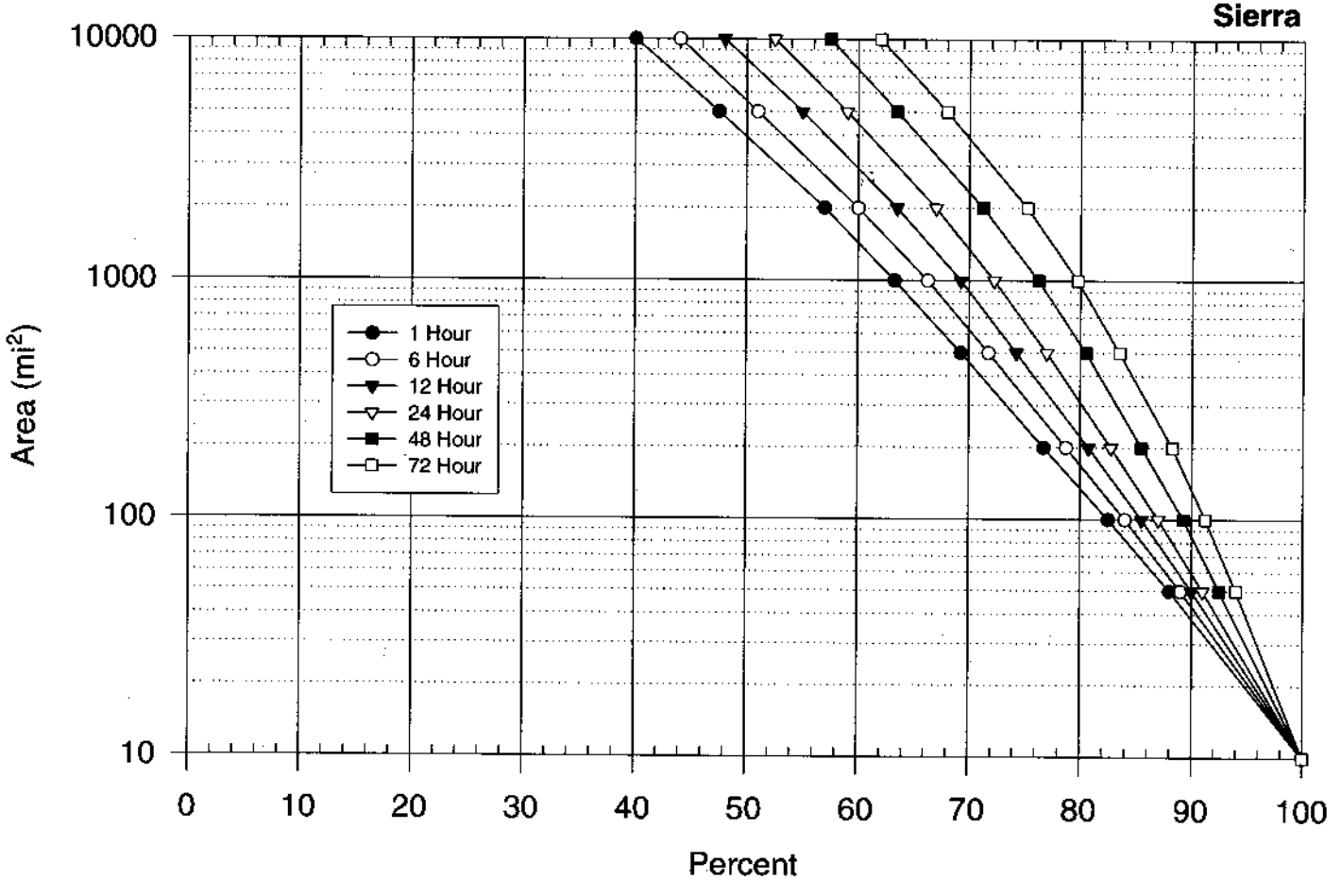

Figure 8.4. *Depth-area relations for the California Sierra region for 1 to 72 hour durations. Same as Figure 13.15.*

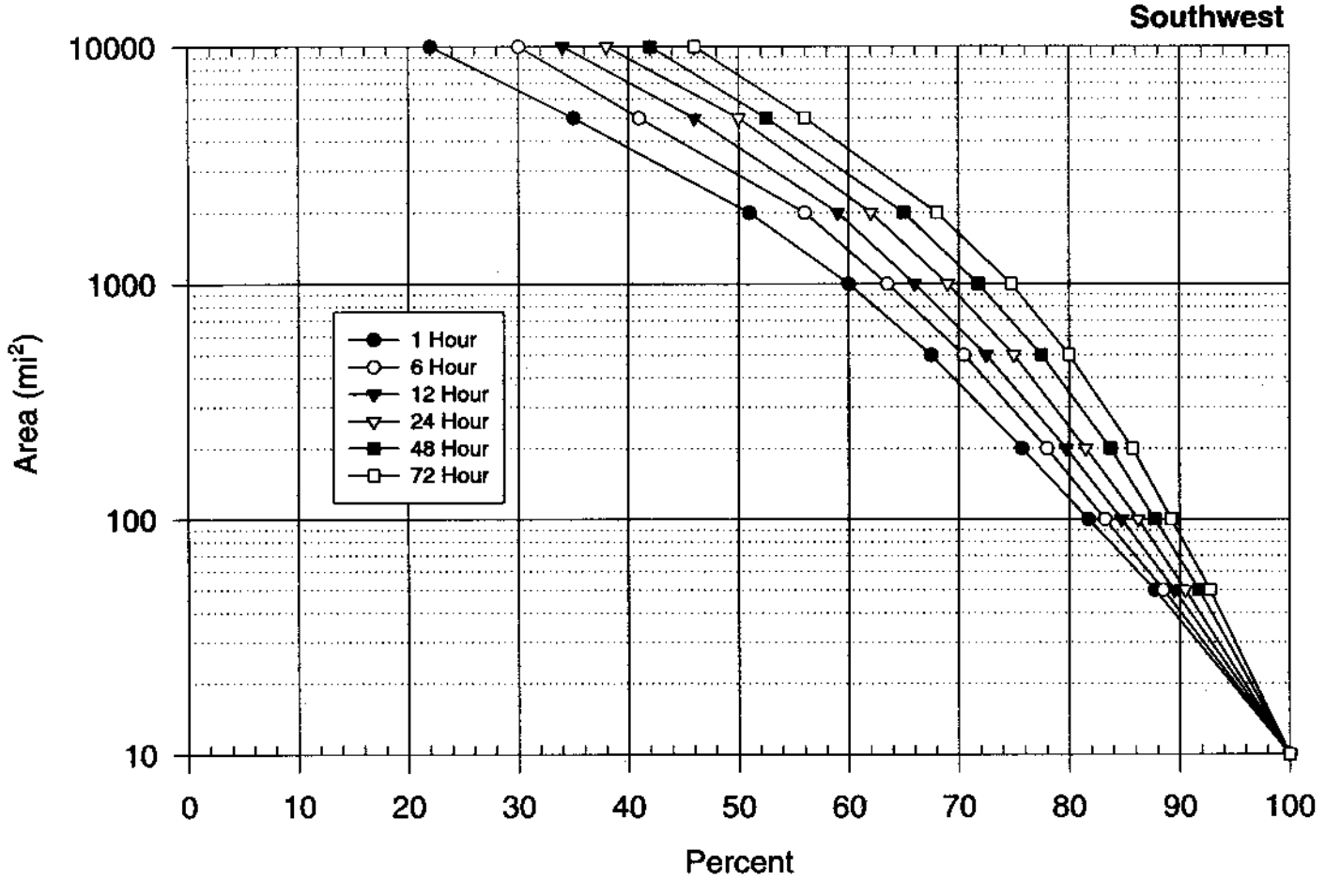

Figure 8.5. *Depth-area relations for the California Southwest region for 1 to 72 hour durations. Same as Figure 13.16.*

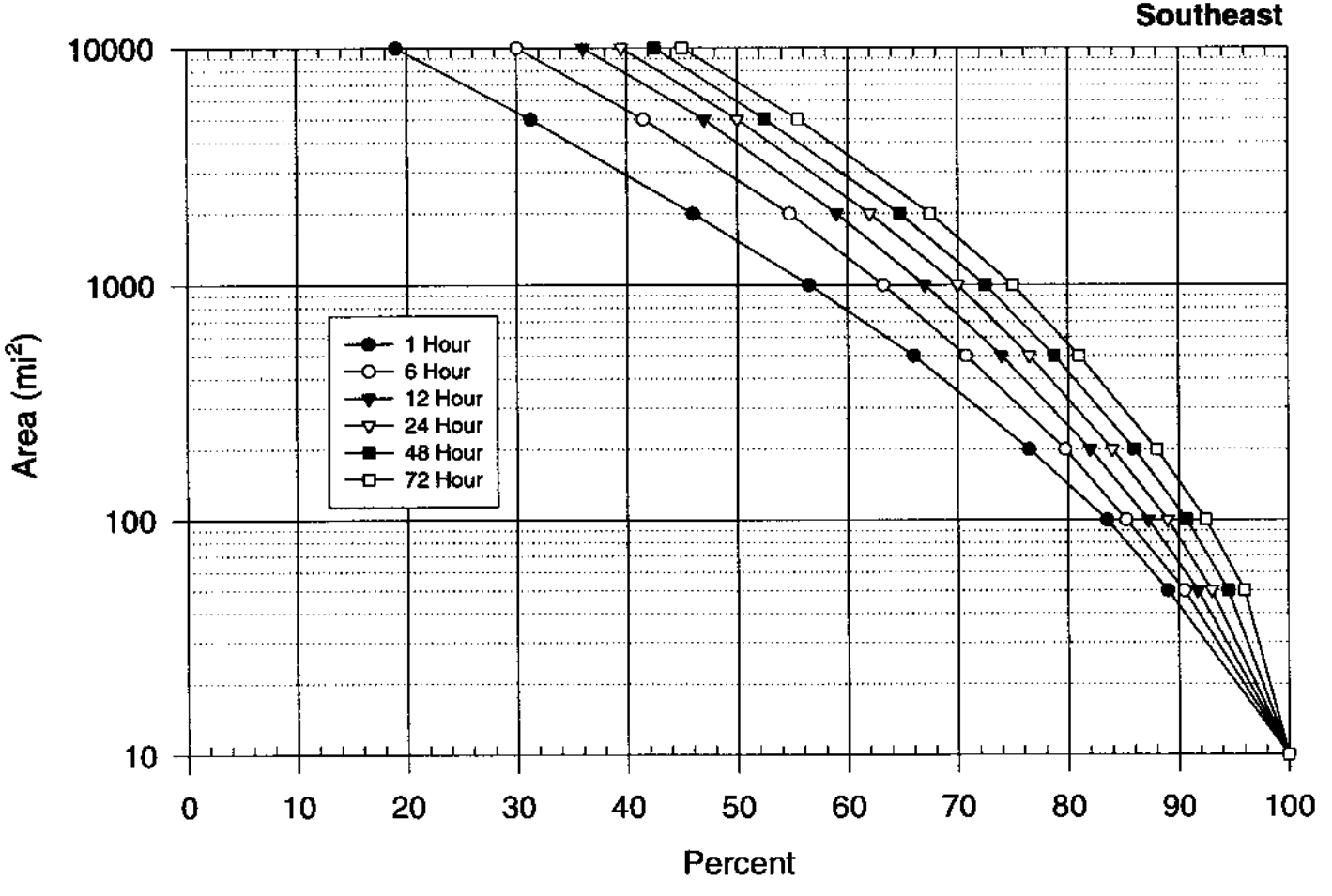

Figure 8.6. *Depth-area relations for the California Southeast region for 1 to 72 hour durations. Same as Figure 13.17.*

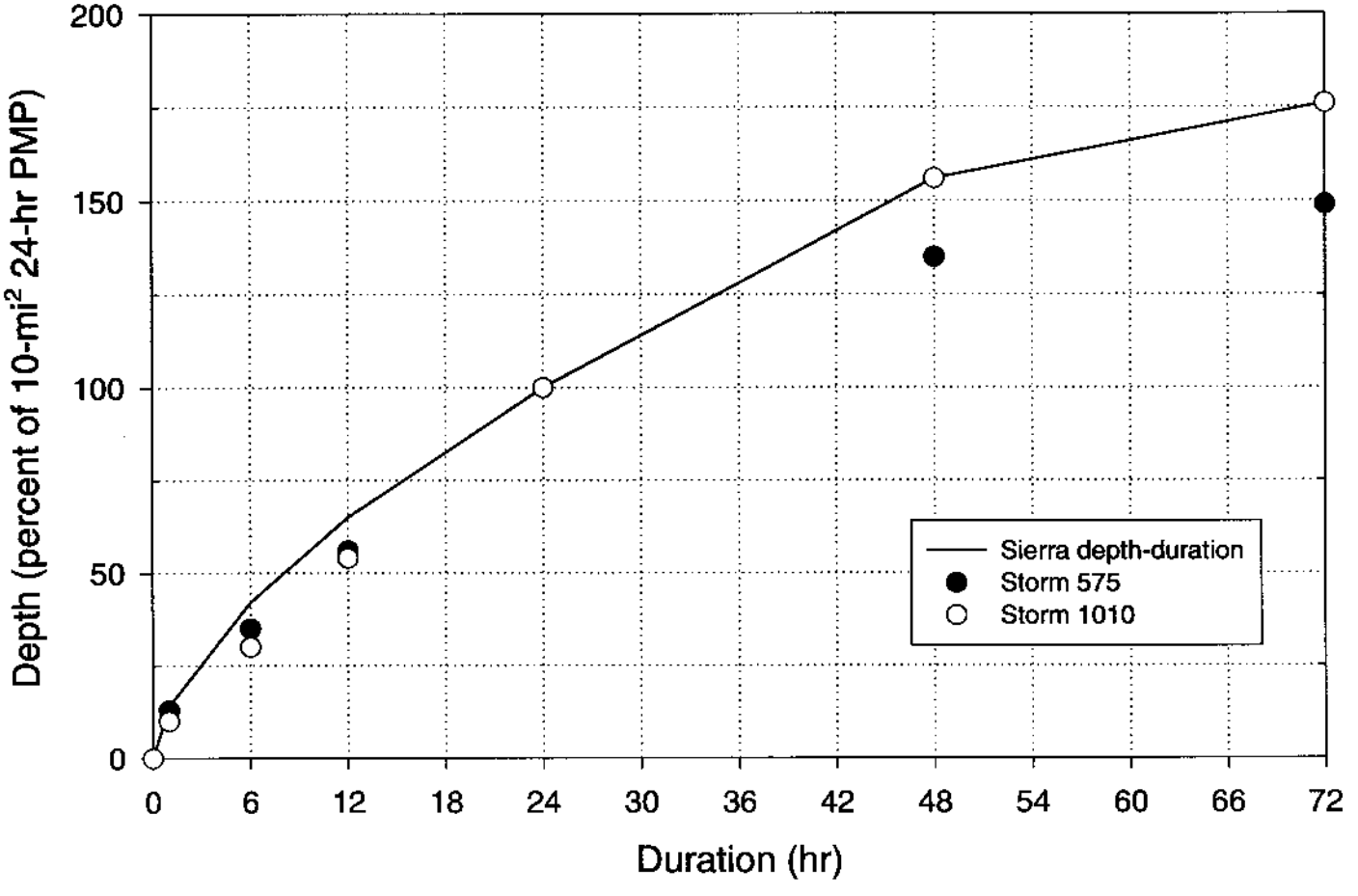

Figure 8.7. *10-mi² depth-duration relation (solid line) for the Sierra region of California. Filled symbols represent calculated storm 575 (October, 1962) values and open symbols represent calculated storm 1010 (February, 1986) values.*

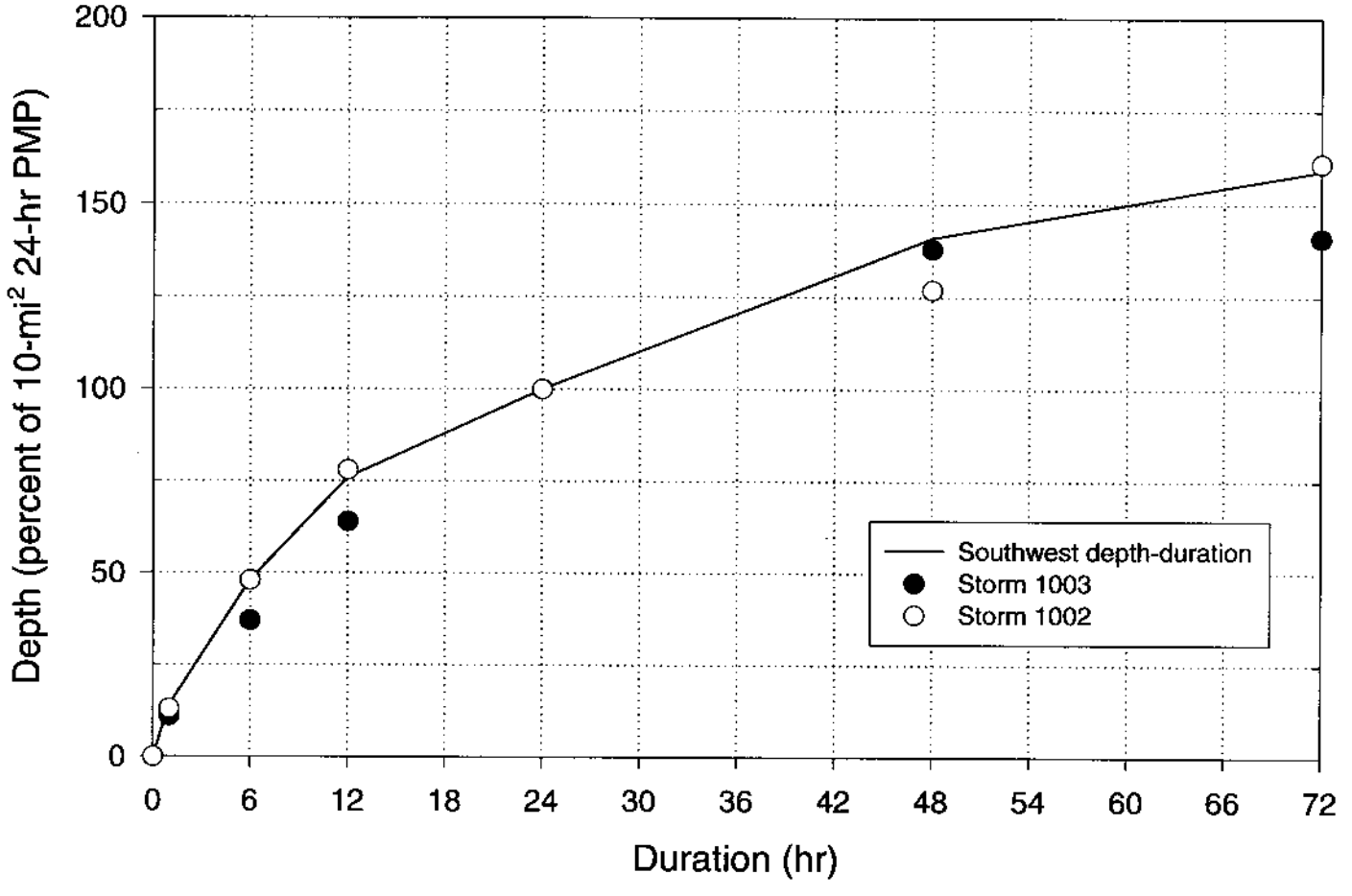

Figure 8.8. *10-mi² depth-duration relation (solid line for the Southwest region of California. Filled symbols represent calculated storm 1003 (January, 1943) values and open symbols represent calculated storm 1002 (February, 1938) values.*

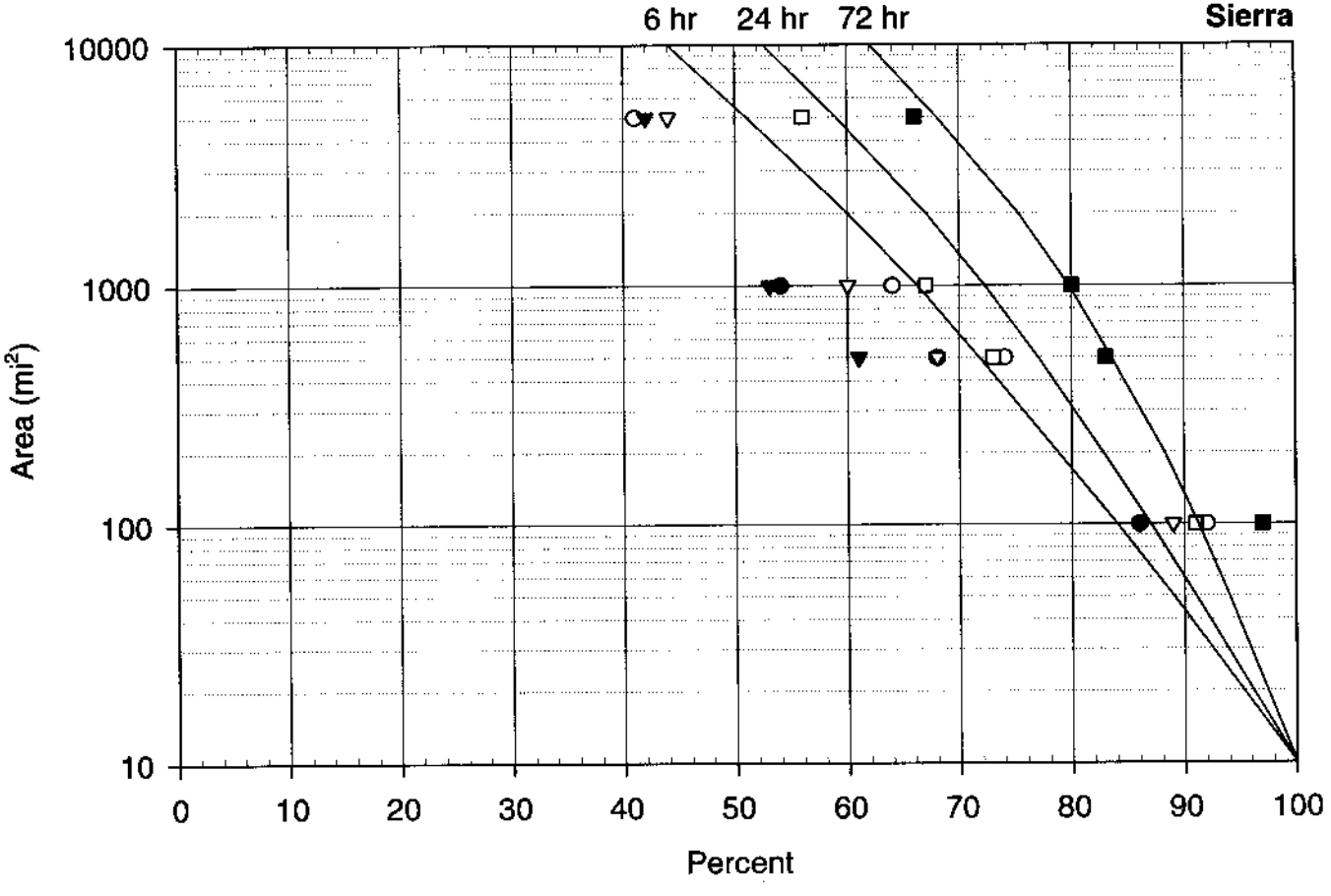

Figure 8.9. *Probable maximum storm depth-area relation (solid lines labeled 6, 24, and 72 hr) for the Sierra region. Open symbols are reduction ratios for storm 1010 (February, 1986); filled symbols are reduction ratios for storm 575 (October, 1962). Circles, triangles and squares represent 6-, 24-, and 72-hr storm values, respectively.*

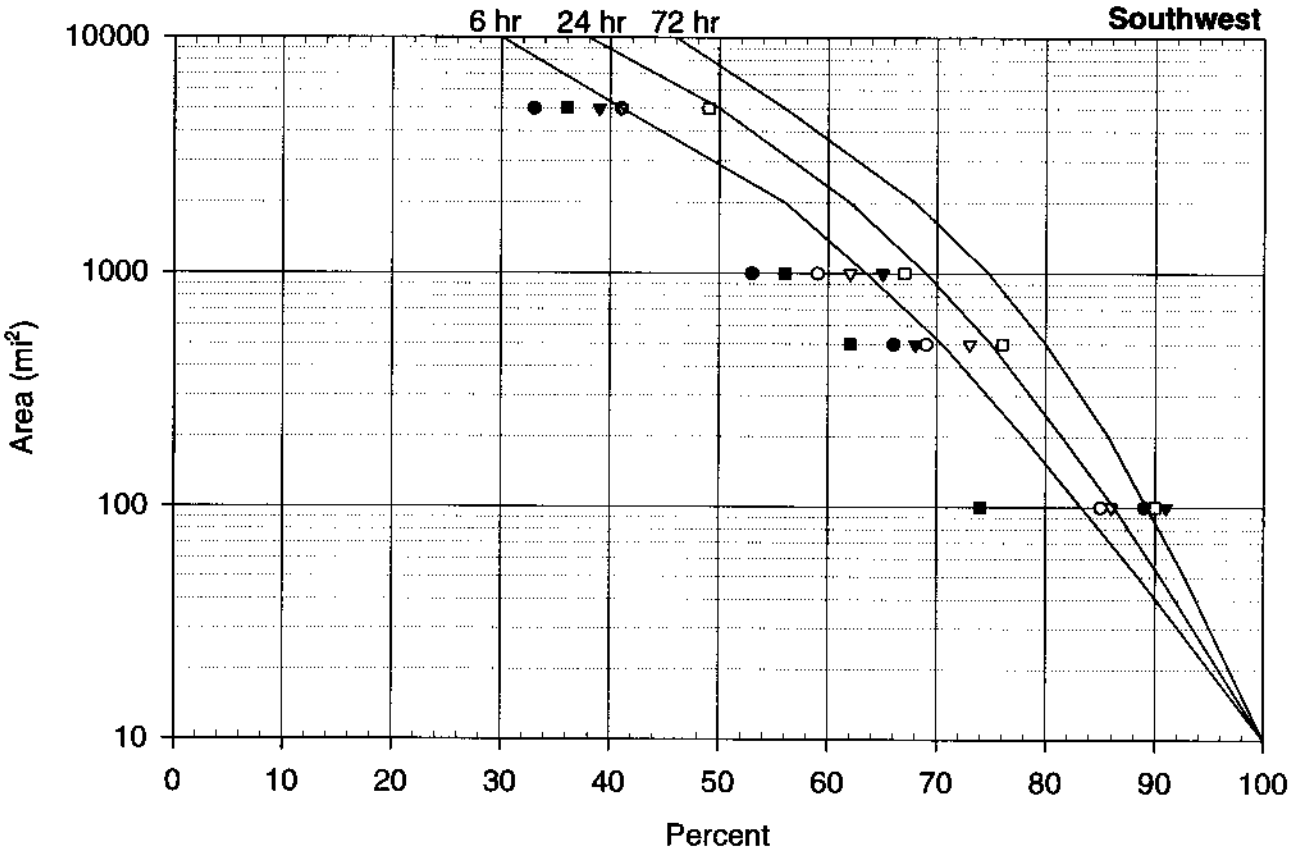

Figure 8.10. *Probable maximum storm depth-area relation (solid lines labeled 6, 24, and 72 hr) for the Southwest region. Open symbols are reduction ratios for storm 1010 (February, 1986); filled symbols are reduction ratios for storm 575 (October 1962). Circles, triangles and squares represent 6-, 24-, and 72-hr storm values, respectively.*

Table 8.3. *Depth-duration values as used in Figures 8.7 and 8.8 for two regions (enveloped) and for two storms found in each region. Values are for 10-mi^2 PMP and individual storm depths, expressed as a percent of 10-mi^2, 24-hour depth.*

Region/ Storm ID No.	Duration (hours) 1	6	12	24	48	72
Sierra	14	42	65	100	156	176
575	13	35	56	100	135	149
1010	10	30	54	100	156	176
Southwest	14	48	76	100	141	159
1002	13	48	78	100	127	161
1003	11	37	64	100	138	141

Table 8.4. *Depth-area values for individual storms (indicated by storm reference number) found in indicated regions. Values are for depth of precipitation at the indicated area size and duration, expressed as a percent of each storm's depth at 10-mi^2. "m" indicates a missing depth. Values are found in Figures 8.9 and 8.10.*

	Sierra Region						Southwest Region					
	Storm 575			Storm 1010			Storm 1002			Storm 1003		
	Duration (Hours)											
Area (mi^2)	6	24	72	6	24	72	6	24	72	6	24	72
5,000	m	42	66	41	44	56	33	39	36	41	41	49
1,000	54	53	80	64	60	67	53	65	56	59	62	67
500	68	61	83	74	68	73	66	68	62	69	73	76
100	86	86	97	92	89	91	89	91	74	85	86	90

8.3 Seasonal Adjustments to General-Storm DAD Curves

Once the all-season DAD relations had been agreed upon, normalized DAD relations from the outstanding seasonal storms were smoothed for durational consistency and then expressed as a percentage of the all-season values. These off-season percentages (referenced as "factors" in this section) fell into two classes: off-season depth-duration factors for 10-mi^2 and off-season depth-area factors for selected durations. The factors were plotted for each class. The y-axis on each diagram was in units of percentage; the x-axis for the depth-duration factors was in units of months away from the envelope of all-season months, and for the depth-area factors it was in units of area size. In the depth-duration factor diagram, the plotted points from the outstanding off-season storms were values (of percentage) for durations of 1-, 6-, 12-, 24-, 36-, 48-, and 72-hours at monthly offsets from the all-season envelope. Contours of percentage were drawn on the diagram for each duration. For the depth-area factor diagram, the plotted percentages were at selected area sizes and for monthly offsets from the all-season envelope. Contours of percentage were also drawn. The results are shown in Table 8.5.

A monthly offset or departure from the all-season envelope of months was considered positive if it followed the last month in the envelope and considered negative if it preceded the first month in the envelope. For example, if the all-season envelope for some location (as determined from Chapter 7, Figures 7.2 to 7.11) extends from October through March, then the "off-season" months of April, May, and June are designated as +1, +2, and +3 months respectively away from the all-season envelope of DAD relations; while September, August, and July are designated as -1, -2, and -3 months offset, respectively, from the envelope of all-season DAD relations. Furthermore, an even number of off-season months can be divided evenly between positive and negative offsets; while for an odd number of off-season months, the remaining month is given a negative offset. The values of the factors are symmetric about the all-season envelope of months. The factors were derived from the four largest (at 10-mi^2, 24-hours) off-season storms (numbers 575, 1012, 1015, and 1016), none of which were located in the southeast DAD region. At the places where the four storms were centered, their dates of occurrence (in units of months departure from the all-season envelope at that site) were -0.5, +2, -3, and -3 months, respectively. Furthermore, these four storms took place in just 3 of the 6 non-southeastern DAD regions. It was therefore decided to group the depth-area and depth-duration factors derived from these

Table 8.5. *Seasonally adjusted 10-mi² depth-duration ratios (monthly offsets).*

Northwest

Offset	1 hr	6 hr	12 hr	24 hr	48 hr	72 hr
1	0.102	0.404	0.734	1.000	1.445	1.682
2	0.106	0.416	0.745	1.000	1.386	1.558
3	0.112	0.428	0.759	1.000	1.341	1.469
4	0.121	0.448	0.774	1.000	1.296	1.416
5	0.127	0.464	0.788	1.000	1.267	1.381

Northeast

Offset	1 hr	6 hr	12 hr	24 hr	48 hr	72 hr
1	0.163	0.525	0.693	1.000	1.358	1.473
2	0.170	0.541	0.704	1.000	1.302	1.364
3	0.179	0.556	0.718	1.000	1.260	1.287
4	0.194	0.582	0.731	1.000	1.218	1.240
5	0.203	0.603	0.745	1.000	1.190	1.209

Midcoastal

Offset	1 hr	6 hr	12 hr	24 hr	48 hr	72 hr
1	0.133	0.455	0.744	1.000	1.407	1.615
2	0.138	0.468	0.755	1.000	1.349	1.496
3	0.146	0.482	0.770	1.000	1.305	1.411
4	0.157	0.504	0.784	1.000	1.262	1.360
5	0.165	0.522	0.799	1.000	1.233	1.326

Central Valley

Offset	1 hr	6 hr	12 hr	24 hr	48 hr	72 hr
1	0.133	0.424	0.653	1.000	1.436	1.663
2	0.138	0.437	0.663	1.000	1.376	1.540
3	0.146	0.449	0.676	1.000	1.332	1.453
4	0.157	0.470	0.689	1.000	1.288	1.400
5	0.165	0.487	0.702	1.000	1.258	1.365

Table 8.5. (cont.) *Seasonally adjusted 10-mi² depth-duration ratios (monthly offsets).*

Sierra

Offset	1 hr	6 hr	12 hr	24 hr	48 hr	72 hr
1	0.143	0.424	0.653	1.000	1.513	1.672
2	0.148	0.437	0.663	1.000	1.451	1.549
3	0.157	0.449	0.676	1.000	1.404	1.461
4	0.169	0.470	0.689	1.000	1.357	1.408
5	0.178	0.487	0.702	1.000	1.326	1.373

Southwest

Offset	1 hr	6 hr	12 hr	24 hr	48 hr	72 hr
1	0.143	0.485	0.764	1.000	1.368	1.511
2	0.148	0.499	0.775	1.000	1.311	1.399
3	0.157	0.514	0.790	1.000	1.269	1.320
4	0.169	0.538	0.806	1.000	1.227	1.272
5	0.178	0.557	0.821	1.000	1.199	1.240

Southeast

Offset	1 hr	6 hr	12 hr	24 hr	48 hr	72 hr
1	0.294	0.594	0.856	1.000	1.206	1.347
2	0.283	0.577	0.843	1.000	1.258	1.455
3	0.268	0.561	0.827	1.000	1.300	1.542
4	0.248	0.536	0.811	1.000	1.345	1.600
5	0.236	0.517	0.796	1.000	1.376	1.641

storms into only 2 regional groups: a non-southeastern and southeastern. The values of the depth-area and depth-duration percentage factors for the southeast region are the inverse of the percentages derived from the rest of California. The contours drawn on the depth-area and depth-duration factor diagrams were, of necessity, based on significant extrapolation from a limited amount of information.

Once the contours were completed, values were extracted to form an array for selected area sizes, durations and monthly departures for the two off-season regions. These percentages were then multiplied with corresponding all-season, regional DAD to produce an array of seasonally-adjusted, regional DAD. These DAD are found in Tables 8.6 to 8.11. Because of the multiplicity of the DAD relations, it was decided not to present them here as plotted curves. The reader who requires values of off-season PMP for a drainage area in one of the DAD regions should plot the appropriate depth-area-duration information, from Tables 8.6 to 8.11, and interpolate as required.

For a particular application, when deciding whether the month of interest should begin with a plus or minus designator, we recommend the user to "take the shorter path" from the edge of the all-season envelope of months to the month of interest, i.e., choose the value which is smaller in absolute value. For example, if the all-season envelope extends from October to March and the month of interest is July, one might choose either -3 or +4. The "shorter path" to July is from October not March so the recommended choice is -3. This kind of decision comes into play only when the all-season envelope of months is an even number.

In most situations it is likely that there is some month in which the average monthly percentage of all-season index PMP for a drainage is 100 percent. However, this might not always be the case. When there is no month in which the average percentage for a drainage is 100 percent, the all-season month or envelope of months is defined as that month or months in which the average percentage is at a maximum. Average percentages within one percent of each other should be regarded as the same.

An example for a particular drainage area will help bring together the several strands developed above. Table 8.12 contains the information needed to calculate PMP for an off-season month at Auburn, a 973-mi^2 drainage located between Sacramento and Lake

Table 8.6. *Seasonally adjusted areal reduction factors for the Northeast and Northwest regions.*

Offset 1 Month						
Area (mi^2)	**1 hr**	**6 hr**	**12 hr**	**24 hr**	**48 hr**	**72 hr**
10	1.000	1.000	1.000	1.000	1.000	1.000
50	0.913	0.930	0.948	0.960	0.967	0.975
100	0.861	0.883	0.905	0.928	0.945	0.960
200	0.785	0.818	0.847	0.871	0.900	0.919
500	0.677	0.725	0.769	0.798	0.835	0.859
1000	0.582	0.644	0.690	0.730	0.762	0.790
2000	0.480	0.559	0.608	0.650	0.680	0.709
5000	0.340	0.436	0.478	0.524	0.561	0.595
10000	0.240	0.338	0.372	0.418	0.467	0.502
Offset 2 Months						
Area (mi^2)	**1 hr**	**6 hr**	**12 hr**	**24 hr**	**48 hr**	**72 hr**
10	1.000	1.000	1.000	1.000	1.000	1.000
50	0.894	0.921	0.939	0.952	0.959	0.965
100	0.831	0.868	0.892	0.916	0.929	0.941
200	0.753	0.802	0.834	0.858	0.880	0.892
500	0.641	0.702	0.746	0.778	0.806	0.825
1000	0.544	0.617	0.658	0.697	0.728	0.751
2000	0.447	0.528	0.570	0.610	0.639	0.666
5000	0.313	0.401	0.436	0.484	0.519	0.552
10000	0.218	0.302	0.335	0.381	0.428	0.459
Offset 3 Months						
Area (mi^2)	**1 hr**	**6 hr**	**12 hr**	**24 hr**	**48 hr**	**72 hr**
10	1.000	1.000	1.000	1.000	1.000	1.000
50	0.883	0.916	0.933	0.944	0.950	0.955
100	0.809	0.859	0.882	0.904	0.916	0.926
200	0.729	0.789	0.821	0.844	0.867	0.878
500	0.619	0.687	0.726	0.757	0.785	0.803
1000	0.522	0.596	0.636	0.671	0.697	0.719
2000	0.425	0.500	0.541	0.576	0.605	0.634
5000	0.294	0.374	0.412	0.451	0.481	0.512
10000	0.205	0.284	0.320	0.355	0.393	0.424

Table 8.6. (cont.) *Seasonally adjusted areal reduction factors for the Northeast and Northwest regions.*

Offset 4 Months

Area (mi^2)	1 hr	6 hr	12 hr	24 hr	48 hr	72 hr
10	1.000	1.000	1.000	1.000	1.000	1.000
50	0.865	0.902	0.926	0.940	0.946	0.952
100	0.787	0.837	0.869	0.890	0.901	0.913
200	0.696	0.760	0.800	0.821	0.842	0.853
500	0.576	0.649	0.695	0.721	0.747	0.765
1000	0.474	0.555	0.601	0.633	0.658	0.679
2000	0.375	0.464	0.502	0.536	0.563	0.590
5000	0.244	0.337	0.375	0.412	0.435	0.459
10000	0.162	0.248	0.283	0.317	0.354	0.383

Offset 5 Months

Area (mi^2)	1 hr	6 hr	12 hr	24 hr	48 hr	72 hr
10	1.000	1.000	1.000	1.000	1.000	1.000
50	0.851	0.893	0.917	0.931	0.946	0.955
100	0.770	0.823	0.851	0.874	0.886	0.898
200	0.672	0.743	0.778	0.801	0.822	0.833
500	0.551	0.627	0.667	0.697	0.722	0.740
1000	0.448	0.538	0.572	0.607	0.635	0.660
2000	0.347	0.445	0.480	0.516	0.546	0.572
5000	0.216	0.322	0.352	0.392	0.425	0.453
10000	0.141	0.228	0.261	0.298	0.339	0.367

Table 8.7. *Seasonally adjusted areal reduction factors for the Midcoastal region.*

Offset 1 Month

Area (mi^2)	1 hr	6 hr	12 hr	24 hr	48 hr	72 hr
10	1.000	1.000	1.000	1.000	1.000	1.000
50	0.903	0.915	0.928	0.943	0.957	0.975
100	0.846	0.868	0.886	0.908	0.930	0.949
200	0.775	0.804	0.832	0.856	0.885	0.909
500	0.663	0.710	0.750	0.778	0.815	0.838
1000	0.564	0.630	0.671	0.706	0.738	0.770
2000	0.458	0.536	0.584	0.621	0.655	0.690
5000	0.308	0.392	0.441	0.486	0.523	0.566
10000	0.188	0.287	0.325	0.374	0.412	0.456

Offset 2 Months

Area (mi^2)	1 hr	6 hr	12 hr	24 hr	48 hr	72 hr
10	1.000	1.000	1.000	1.000	1.000	1.000
50	0.885	0.906	0.919	0.935	0.949	0.965
100	0.817	0.853	0.872	0.896	0.914	0.931
200	0.743	0.787	0.820	0.843	0.866	0.882
500	0.627	0.688	0.727	0.758	0.786	0.805
1000	0.527	0.603	0.639	0.673	0.704	0.732
2000	0.427	0.506	0.547	0.582	0.616	0.648
5000	0.283	0.360	0.403	0.450	0.484	0.525
10000	0.170	0.257	0.293	0.340	0.378	0.417

Offset 3 Months

Area (mi^2)	1 hr	6 hr	12 hr	24 hr	48 hr	72 hr
10	1.000	1.000	1.000	1.000	1.000	1.000
50	0.874	0.902	0.913	0.927	0.940	0.955
100	0.795	0.844	0.862	0.885	0.901	0.917
200	0.719	0.775	0.807	0.830	0.852	0.869
500	0.606	0.673	0.708	0.739	0.766	0.784
1000	0.505	0.583	0.619	0.648	0.674	0.701
2000	0.405	0.480	0.520	0.550	0.583	0.616
5000	0.266	0.336	0.381	0.419	0.448	0.487
10000	0.160	0.241	0.279	0.317	0.347	0.385

Table 8.7. (cont.) *Seasonally adjusted areal reduction factors for the Midcoastal region.*

Offset 4 Months

Area (mi^2)	1 hr	6 hr	12 hr	24 hr	48 hr	72 hr
10	1.000	1.000	1.000	1.000	1.000	1.000
50	0.855	0.888	0.907	0.923	0.936	0.952
100	0.774	0.823	0.850	0.871	0.887	0.903
200	0.688	0.746	0.786	0.807	0.827	0.843
500	0.564	0.636	0.677	0.703	0.729	0.747
1000	0.459	0.543	0.584	0.612	0.637	0.662
2000	0.358	0.445	0.483	0.512	0.543	0.574
5000	0.220	0.303	0.347	0.382	0.406	0.437
10000	0.126	0.211	0.247	0.284	0.313	0.348

Offset 5 Months

Area (mi^2)	1 hr	6 hr	12 hr	24 hr	48 hr	72 hr
10	1.000	1.000	1.000	1.000	1.000	0.000
50	0.842	0.879	0.897	0.915	0.936	0.000
100	0.757	0.809	0.832	0.855	0.872	0.000
200	0.664	0.730	0.765	0.787	0.808	48.000
500	0.539	0.614	0.650	0.679	0.705	1.016
1000	0.434	0.526	0.556	0.587	0.615	0.919
2000	0.331	0.427	0.461	0.493	0.526	0.875
5000	0.196	0.289	0.325	0.364	0.396	0.834
10000	0.110	0.194	0.228	0.267	0.299	0.749

Table 8.8. *Seasonally adjusted areal reduction factors for the Central Valley region.*

Offset 1 Month

Area (mi^2)	1 hr	6 hr	12 hr	24 hr	48 hr	72 hr
10	1.000	1.000	1.000	1.000	1.000	1.000
50	0.828	0.886	0.918	0.940	0.952	0.970
100	0.752	0.823	0.866	0.893	0.915	0.934
200	0.663	0.750	0.798	0.832	0.860	0.889
500	0.536	0.638	0.701	0.739	0.775	0.803
1000	0.437	0.541	0.608	0.652	0.683	0.715
2000	0.333	0.440	0.504	0.548	0.582	0.616
5000	0.207	0.295	0.350	0.393	0.432	0.466
10000	0.113	0.182	0.222	0.267	0.302	0.339

Offset 2 Months

Area (mi^2)	1 hr	6 hr	12 hr	24 hr	48 hr	72 hr
10	1.000	1.000	1.000	1.000	1.000	1.000
50	0.812	0.877	0.909	0.932	0.944	0.960
100	0.726	0.809	0.853	0.882	0.899	0.916
200	0.636	0.734	0.786	0.819	0.841	0.862
500	0.507	0.618	0.679	0.720	0.748	0.771
1000	0.408	0.518	0.580	0.622	0.652	0.679
2000	0.310	0.415	0.472	0.514	0.547	0.578
5000	0.190	0.271	0.320	0.363	0.400	0.432
10000	0.102	0.162	0.200	0.243	0.277	0.310

Offset 3 Months

Area (mi^2)	1 hr	6 hr	12 hr	24 hr	48 hr	72 hr
10	1.000	1.000	1.000	1.000	1.000	1.000
50	0.802	0.872	0.903	0.924	0.935	0.951
100	0.707	0.801	0.843	0.870	0.886	0.902
200	0.615	0.723	0.774	0.806	0.828	0.849
500	0.490	0.605	0.661	0.701	0.729	0.751
1000	0.391	0.500	0.561	0.599	0.624	0.651
2000	0.295	0.394	0.448	0.486	0.518	0.550
5000	0.179	0.253	0.302	0.338	0.371	0.400
10000	0.096	0.153	0.191	0.227	0.254	0.287

Table 8.8. (cont.) *Seasonally adjusted areal reduction factors for the Central Valley region.*

Offset 4 Months

Area (mi^2)	1 hr	6 hr	12 hr	24 hr	48 hr	72 hr
10	1.000	1.000	1.000	1.000	1.000	1.000
50	0.785	0.859	0.897	0.920	0.931	0.947
100	0.688	0.780	0.831	0.857	0.873	0.889
200	0.588	0.696	0.753	0.784	0.804	0.825
500	0.456	0.572	0.633	0.668	0.694	0.716
1000	0.355	0.466	0.529	0.565	0.590	0.615
2000	0.260	0.365	0.416	0.452	0.482	0.513
5000	0.148	0.228	0.275	0.309	0.336	0.359
10000	0.076	0.133	0.169	0.203	0.229	0.259

Offset 5 Months

Area (mi^2)	1 hr	6 hr	12 hr	24 hr	48 hr	72 hr
10	1.000	1.000	1.000	1.000	1.000	1.000
50	0.772	0.850	0.888	0.912	0.931	0.951
100	0.673	0.768	0.813	0.841	0.858	0.874
200	0.568	0.681	0.733	0.764	0.785	0.805
500	0.436	0.552	0.608	0.645	0.670	0.692
1000	0.336	0.451	0.504	0.542	0.569	0.597
2000	0.241	0.350	0.398	0.435	0.467	0.497
5000	0.131	0.218	0.258	0.294	0.328	0.354
10000	0.066	0.123	0.156	0.191	0.219	0.248

Table 8.9. *Seasonally adjusted areal reduction factors for the Sierra region.*

Offset 1 Month

Area (mi^2)	1 hr	6 hr	12 hr	24 hr	48 hr	72 hr
10	1.000	1.000	1.000	1.000	1.000	1.000
50	0.908	0.920	0.933	0.950	0.962	0.985
100	0.851	0.868	0.886	0.908	0.930	0.960
200	0.775	0.799	0.822	0.851	0.880	0.919
500	0.667	0.706	0.745	0.778	0.820	0.859
1000	0.582	0.630	0.676	0.715	0.762	0.810
2000	0.493	0.550	0.603	0.650	0.699	0.749
5000	0.385	0.449	0.501	0.552	0.608	0.653
10000	0.300	0.372	0.410	0.472	0.531	0.577

Offset 2 Months

Area (mi^2)	1 hr	6 hr	12 hr	24 hr	48 hr	72 hr
10	1.000	1.000	1.000	1.000	1.000	1.000
50	0.889	0.911	0.924	0.942	0.954	0.975
100	0.821	0.853	0.872	0.896	0.914	0.941
200	0.743	0.782	0.810	0.839	0.861	0.892
500	0.632	0.684	0.722	0.758	0.791	0.825
1000	0.544	0.603	0.644	0.683	0.728	0.770
2000	0.459	0.519	0.565	0.610	0.658	0.703
5000	0.354	0.413	0.457	0.510	0.563	0.605
10000	0.272	0.332	0.370	0.429	0.487	0.527

Offset 3 Months

Area (mi^2)	1 hr	6 hr	12 hr	24 hr	48 hr	72 hr
10	1.000	1.000	1.000	1.000	1.000	1.000
50	0.878	0.907	0.918	0.934	0.945	0.965
100	0.800	0.844	0.862	0.885	0.901	0.926
200	0.719	0.770	0.797	0.825	0.847	0.878
500	0.611	0.669	0.703	0.739	0.771	0.803
1000	0.522	0.583	0.623	0.657	0.697	0.737
2000	0.436	0.492	0.537	0.576	0.622	0.669
5000	0.333	0.385	0.432	0.475	0.522	0.561
10000	0.256	0.312	0.353	0.400	0.447	0.487

Table 8.9. (cont.) *Seasonally adjusted areal reduction factors for the Sierra region.*

Offset 4 Months

Area (mi^2)	1 hr	6 hr	12 hr	24 hr	48 hr	72 hr
10	1.000	1.000	1.000	1.000	1.000	1.000
50	0.860	0.893	0.912	0.930	0.941	0.961
100	0.778	0.823	0.850	0.871	0.887	0.913
200	0.688	0.742	0.777	0.802	0.823	0.853
500	0.568	0.632	0.673	0.703	0.734	0.765
1000	0.474	0.543	0.588	0.621	0.658	0.697
2000	0.385	0.456	0.498	0.536	0.579	0.623
5000	0.276	0.347	0.393	0.434	0.472	0.503
10000	0.202	0.273	0.312	0.358	0.403	0.440

Offset 5 Months

Area (mi^2)	1 hr	6 hr	12 hr	24 hr	48 hr	72 hr
10	1.000	1.000	1.000	1.000	1.000	1.000
50	0.846	0.883	0.902	0.922	0.941	0.965
100	0.761	0.809	0.832	0.855	0.872	0.898
200	0.664	0.725	0.756	0.783	0.803	0.833
500	0.543	0.610	0.646	0.679	0.709	0.740
1000	0.448	0.526	0.560	0.595	0.635	0.676
2000	0.356	0.438	0.476	0.516	0.561	0.604
5000	0.245	0.332	0.369	0.413	0.461	0.496
10000	0.176	0.251	0.288	0.337	0.386	0.422

Table 8.10. *Seasonally adjusted areal reduction factors for the Southwest region.*

Offset 1 Month

Area (mi^2)	1 hr	6 hr	12 hr	24 hr	48 hr	72 hr
10	1.000	1.000	1.000	1.000	1.000	1.000
50	0.893	0.915	0.928	0.940	0.952	0.965
100	0.837	0.863	0.881	0.898	0.920	0.939
200	0.770	0.799	0.818	0.842	0.870	0.899
500	0.658	0.696	0.730	0.758	0.795	0.828
1000	0.555	0.611	0.647	0.686	0.723	0.760
2000	0.441	0.513	0.561	0.601	0.636	0.670
5000	0.284	0.361	0.419	0.468	0.499	0.538
10000	0.165	0.254	0.291	0.338	0.384	0.428

Offset 2 Months

Area (mi^2)	1 hr	6 hr	12 hr	24 hr	48 hr	72 hr
10	1.000	1.000	1.000	1.000	1.000	1.000
50	0.875	0.906	0.919	0.932	0.944	0.955
100	0.807	0.848	0.867	0.887	0.904	0.921
200	0.739	0.782	0.805	0.829	0.851	0.872
500	0.623	0.674	0.708	0.739	0.767	0.795
1000	0.519	0.585	0.616	0.655	0.690	0.722
2000	0.411	0.484	0.525	0.564	0.598	0.629
5000	0.261	0.332	0.382	0.433	0.462	0.498
10000	0.150	0.227	0.262	0.308	0.353	0.391

Offset 3 Months

Area (mi^2)	1 hr	6 hr	12 hr	24 hr	48 hr	72 hr
10	1.000	1.000	1.000	1.000	1.000	1.000
50	0.864	0.902	0.913	0.924	0.935	0.946
100	0.786	0.840	0.858	0.875	0.891	0.907
200	0.715	0.770	0.793	0.815	0.838	0.859
500	0.602	0.660	0.689	0.720	0.747	0.775
1000	0.497	0.566	0.596	0.630	0.661	0.692
2000	0.390	0.459	0.499	0.533	0.566	0.598
5000	0.245	0.310	0.361	0.403	0.428	0.462
10000	0.141	0.213	0.250	0.287	0.323	0.361

Table 8.10. (cont.) *Seasonally adjusted areal reduction factors for the Southwest region.*

Offset 4 Months

Area (mi^2)	1 hr	6 hr	12 hr	24 hr	48 hr	72 hr
10	1.000	1.000	1.000	1.000	1.000	1.000
50	0.846	0.888	0.907	0.920	0.931	0.942
100	0.765	0.818	0.845	0.861	0.877	0.894
200	0.683	0.742	0.772	0.793	0.813	0.834
500	0.560	0.624	0.659	0.685	0.712	0.738
1000	0.451	0.527	0.563	0.595	0.624	0.654
2000	0.344	0.426	0.463	0.496	0.527	0.558
5000	0.203	0.279	0.329	0.368	0.387	0.414
10000	0.111	0.186	0.221	0.257	0.292	0.327

Offset 5 Months

Area (mi^2)	1 hr	6 hr	12 hr	24 hr	48 hr	72 hr
10	1.000	1.000	1.000	1.000	1.000	1.000
50	0.833	0.879	0.897	0.912	0.931	0.946
100	0.748	0.805	0.827	0.846	0.863	0.879
200	0.660	0.725	0.751	0.774	0.794	0.814
500	0.536	0.602	0.633	0.662	0.688	0.713
1000	0.427	0.510	0.536	0.571	0.602	0.635
2000	0.319	0.409	0.443	0.477	0.510	0.541
5000	0.180	0.267	0.308	0.350	0.378	0.409
10000	0.097	0.171	0.204	0.241	0.279	0.313

Table 8.11. *Seasonally adjusted areal reduction factors for the Southeast region.*

Offset 1 Month

Area (mi^2)	1 hr	6 hr	12 hr	24 hr	48 hr	72 hr
10	1.000	1.000	1.000	1.000	1.000	1.000
50	0.902	0.935	0.945	0.952	0.964	0.970
100	0.838	0.877	0.894	0.912	0.920	0.929
200	0.779	0.832	0.848	0.874	0.880	0.891
500	0.713	0.760	0.776	0.807	0.820	0.837
1000	0.643	0.702	0.725	0.745	0.763	0.780
2000	0.561	0.622	0.647	0.655	0.675	0.690
5000	0.389	0.477	0.522	0.535	0.553	0.573
10000	0.253	0.355	0.427	0.444	0.464	0.484

Offset 2 Months

Area (mi^2)	1 hr	6 hr	12 hr	24 hr	48 hr	72 hr
10	1.000	1.000	1.000	1.000	1.000	1.000
50	0.921	0.944	0.954	0.960	0.972	0.980
100	0.869	0.892	0.908	0.924	0.936	0.947
200	0.813	0.849	0.861	0.887	0.900	0.918
500	0.753	0.785	0.800	0.828	0.850	0.871
1000	0.688	0.733	0.761	0.781	0.799	0.821
2000	0.602	0.659	0.691	0.698	0.717	0.735
5000	0.423	0.519	0.572	0.578	0.597	0.618
10000	0.279	0.397	0.474	0.488	0.506	0.529

Offset 3 Months

Area (mi^2)	1 hr	6 hr	12 hr	24 hr	48 hr	72 hr
10	1.000	1.000	1.000	1.000	1.000	1.000
50	0.932	0.949	0.960	0.968	0.982	0.990
100	0.892	0.902	0.918	0.936	0.950	0.962
200	0.840	0.862	0.874	0.902	0.914	0.933
500	0.779	0.802	0.822	0.850	0.872	0.894
1000	0.718	0.759	0.787	0.811	0.834	0.857
2000	0.634	0.695	0.728	0.738	0.759	0.773
5000	0.450	0.556	0.605	0.621	0.644	0.667
10000	0.297	0.423	0.497	0.523	0.552	0.573

Table 8.11. (cont.) *Seasonally adjusted areal reduction factors for the Southeast region.*

Offset 4 Months

Area (mi^2)	1 hr	6 hr	12 hr	24 hr	48 hr	72 hr
10	1.000	1.000	1.000	1.000	1.000	1.000
50	0.952	0.964	0.967	0.972	0.986	0.994
100	0.917	0.926	0.932	0.951	0.965	0.976
200	0.879	0.896	0.898	0.927	0.941	0.961
500	0.838	0.849	0.859	0.893	0.916	0.939
1000	0.791	0.815	0.833	0.859	0.883	0.907
2000	0.719	0.750	0.783	0.794	0.815	0.829
5000	0.543	0.618	0.664	0.680	0.711	0.743
10000	0.376	0.484	0.562	0.585	0.612	0.634

Offset 5 Months

Area (mi^2)	1 hr	6 hr	12 hr	24 hr	48 hr	72 hr
10	1.000	1.000	1.000	1.000	1.000	1.000
50	0.968	0.974	0.977	0.981	0.986	0.990
100	0.938	0.941	0.952	0.968	0.981	0.993
200	0.910	0.916	0.923	0.951	0.964	0.984
500	0.876	0.880	0.894	0.924	0.948	0.971
1000	0.836	0.841	0.875	0.896	0.915	0.934
2000	0.776	0.781	0.820	0.825	0.841	0.855
5000	0.612	0.646	0.709	0.714	0.729	0.753
10000	0.432	0.526	0.608	0.622	0.639	0.662